TBS®
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ATP ä Tissue Processor

Catalog # ATP1-120, ATP1-220

Operations Manual

Version 5.3, May 2006

Be certain to read this manual thoroughly
before proceeding with unpacking and installation.

WELCOME

Thank you for selecting the **ATP**™ Automated Tissue Processor. This instrument was carefully designed to be easy to use, safe to operate and capable of producing consistent, quality results. The embedded Personal Computer affords you the flexibility and reproducibility required by the modern laboratory. The built-in software safety features protect you (the operator) while its internal electronic sensors protect the instrument's critical components. The ability to optimize each step of every program will allow you to create programs that yield excellent reproducible results consistently.

The employees of TBS thank you for your support. Feel free to call TBS customer service at 919-384-9393 or e-mail us for support at service@trianglebiomedical.com.

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INTRODUCTION

Thank you for purchasing an ATP™. The instrument was designed by experienced engineers with the input of service and laboratory technicians. The number one priority was to produce the most dependable tissue processor on the market. After getting to know your instrument, we trust that you will agree. As always, TBS® sincerely welcomes your suggestions for any improvements.

CHAPTER 1 – GENERAL INFORMATION

Before using the instrument, please make certain that you carefully read this manual. Pay particular attention to the precautions that must be taken for user and product safety.

The ATP™ is an automatic tissue processor for laboratory use. It should only be used for routine processing of histological tissue samples.

To avoid potential instrument damage, do not use different reagents from those specified in Chapter 4.

The instrument should only be operated by qualified technicians.

The warranty applies only if the instrument is used in the correct manner and in accordance with the information and advice provided herein. The manufacturer declines all responsibility for possible damages to persons and/or objects due to improper or inexperienced use of the instrument.

1.1 – REGULATORY COMPLIANCE

SAFETY / QUALITY STANDARDS

The ATP™ has been tested by a registered independent body to rigorous international quality and safety standards, and has been found to be in compliance with the following regulations/specifications:

TUV Rheinland of North America, Inc. C US	**UL** 61010A
	CSA 1010-1
	CE EN/IEC EN61010-1, Safety EN61000-3-2, Harmonic Distortion EN55011, Emissions EN61326, Immunity EN61000-3-3, Voltage Fluctuation/Flicker

1.2 – PATENTS, TRADEMARKS AND SPECIFICATIONS

Prices and specifications are current at time of publication; however, they are subject to change without notification. Please contact our North Carolina office or one of our distributors for current prices and availability. ATP™ and Innovations for Science™ are trademarks and TBS ® is a registered trademark of Triangle Biomedical Sciences, Inc., Durham, NC U.S.A. The ATP has certain features that are covered

under Patent # US 6,780,380 B2.

1.3 – Symbols and Conventions

Do not use free flame near the instrument

No smoking near the instrument

Recyclable

High voltage

Important safety notice

Important operation information

1.4 – ABBREVIATIONS AND UNITS OF MEASURE

ABBREVIATIONS

A/D	Analog/Digital Converter
CCW	Paraffin Wax Heating Chamber
CdP	Retort (Processing Chamber)
MdC	Control Module
MV	Main Valve
PMP	Air Pump
PNV	Ambient Valve
PV1	Pressure Valve
SdO	Overfill Sensor
SdP	Rotating Valve Position Sensor
SGR	Reagents Management System
VR	Rotating Valve
VT	Vapor Trap
VV1	Vacuum Valve
WPC	Paraffin Wax Purification Cycle
Retort	Processing chamber

UNITS OF MEASURE

Bar	Pressure unit of measure
mBar	Millibar; 1000 mBar = 1 Bar
W	Power unit of measure; Watt
Ω	Resistance unit of measure; Ohm
A	Current unit of measure; Ampere
V	Voltage unit of measure; Volt

1.5 – SAFETY PRECAUTIONS

Carefully follow the installation instructions:

- Severe damage can result if the instrument is connected to a power supply different from that stated in the manual and on the identification tag at the rear of the instrument.

*The instrument must **NEVER** be used without being connected to an appropriate ground. If damages due to transport occur, **DO NOT** use and **DO NOT** connect the instrument to a power source. Contact TBS technical service.*

- This instrument has been designed to work 24 hours a day; for this reason and for operative precautions, the power switch is placed at the rear of the instrument, on the right-hand side at approximately the same height as the screen in the front.

- Always make certain to correctly engage the reagent bottles.

***NEVER** use ACETONE, BENZENE, or TRICHLOROETHANE.*

- Fixatives with mercury salts, acetic or picric acid may corrode metal. We strongly advise against their use.

- **DO NOT** open the Retort lid when the instrument is working without having previously followed the instructions contained in this manual.

- Use specific precautions in handling flammable reagents such as ethanol.

- Use specific precautions in handling liquid paraffin waxes as they can cause burns.

- The emptying and filling of reagent bottles must only be done by qualified personnel.

- Due to the presence of flammable substances inside reagent bottles, it is recommended to:

Avoid smoking near the instrument.

Avoid using open flames near the instrument (e.g. Bunsen burner).

- **DO NOT** wear clothes that are prone to create electrostatic charges while handling reagents (wool, synthetic fibers, etc.).

- Contaminated reagent waste must be disposed of in accordance with all applicable laws and ordinances.

- Access to the instrument's internal components is reserved only to those specialists trained in the service of the instrument.

Always disconnect the processor from the electrical source before accessing the electronics.

- Only original spare parts sold by the manufacturer or by authorized dealers are recommended for the instrument.

***BEFORE** replacing fuses, disconnect the instrument from the power source.*

***DO NOT** extract bottles, replace reagents or do other maintenance operations when the instrument is operating.*

CHAPTER 2 – UNPACKING, PACKING AND TRANSPORTING

Before moving or transporting the instrument, it is essential to carefully read this chapter, paying particular attention to the instrument setup instructions.

The warranty is invalid if the instrument is improperly operated. Be certain to follow the instructions and recommendations provided by this manual. The manufacturer is not responsible for damages resulting from improper operation or handling of the instrument. If the crate is damaged, inform the driver and get written acknowledgment of the damage on the delivery truck or you may forfeit any rights for damage recovery.

Pay particular attention to the outside of the shipping container. In the event of concealed damage, save all shipping crates and packing material. **DO NOT** unpack the instrument if damage is apparent. Immediately notify the carrier of any damage and contact the shipper to initiate any claims.

2.1 – UNPACKING

The proper steps to be taken for unpacking are:

1) Open the rear of the box.
2) Remove the screws securing the top.
3) Remove screws and nails securing the wooden sides to the base of the box.
4) Lift the side walls out of the way.
5) Raise the instrument to the vertical position as you move it off of the wooden pallet.
6) Remove the plastic layers that wrap the instrument.
7) Remove the nylon bag that contains the instrument.
8) Carefully check the external condition of the instrument. In the event of concealed damage, **DO NOT** plug in the instrument. Immediately notify the carrier and promptly contact the seller.
9) For the setup of the instrument, see the specific chapter in this manual.
10) Save the box and internal packaging for future shipment.

2.2 – PACKAGING AND/OR PREPARATION FOR TRANSPORT

To transport the instrument, perform the following steps:

1) Remove all reagents (paraffin included) from their bottles.
2) Remove and close, with the proper threaded cap, the charcoal filter bottles.
3) Transport the charcoal filter bottles separately from the instrument, wrapped and securely closed in a protective nylon bag.
4) If the original box has been saved, follow the unpacking instructions in the reverse order, using all the interior packaging to avoid serious damage to the instrument during shipping.
5) Using the original box or another box adapted to carry the instrument horizontally, lay the carton on its back after having properly wrapped and packaged the instrument with care.

2.3 – TRANSPORTATION

Before shipping, please keep in mind that:

1) The instrument is very fragile.
2) The instrument is composed of electronic parts.
3) Contact with water and/or any other liquid is to be avoided; please ensure that the internal plastic protection bag that wraps the instrument is utilized.
4) Transporting and storing temperature(s) must be between -10°C +50°C.
5) Using the original box, the instrument must always be transported horizontally.
6) Transporting the instrument vertically could result in significant damage as its center of gravity is quite high.

CHAPTER 3 – INTRODUCTION TO THE ATP ä PROCESSOR

3.1 – GENERAL FEATURES

- The ATP™ tissue processor recycles the air utilized to move the reagents to and from the Retort. Two effective charcoal filters on the external air-intake reduce the exhaust fumes to acceptable levels.

- The control devices (hardware and software) are based on up-to-date processing control technologies. A 9.5" backlit LCD touch screen display makes the instrument easy and efficient to use.

- Up to 12 different programs can be permanently stored and can be easily modified. A 13th program is a special "**REVERSED**" program that is used to de-process samples where further procedures are required.

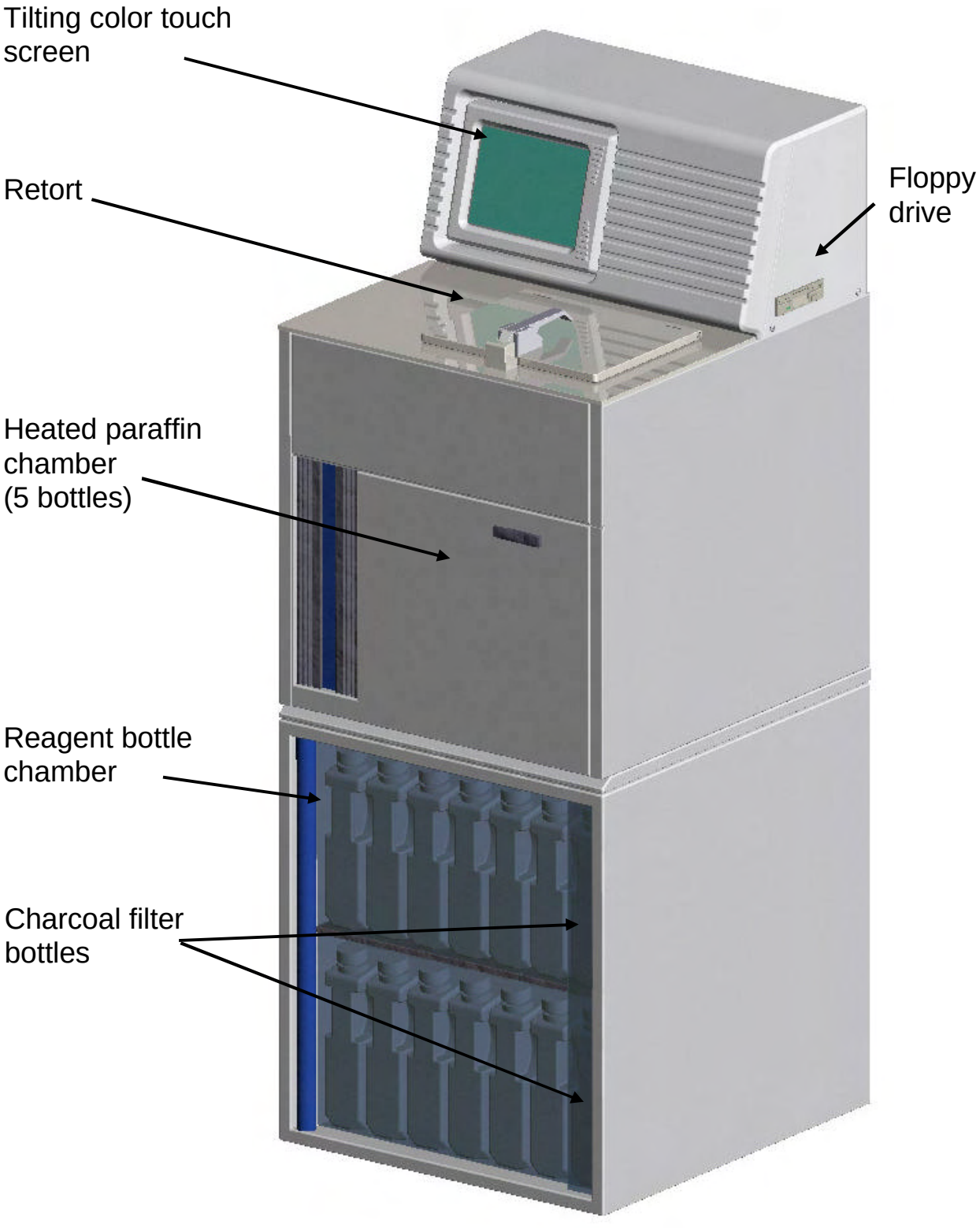
- During a run, every step and action is displayed on the screen, such as current step and function (emptying, filling, etc.), Retort and paraffin heating chamber temperatures, Retort pressure, completion time and date.

- In the event of blackouts, the computer saves all the data necessary to restart the process exactly where it was interrupted. If the interruption happens during the paraffin stages, particular precautions are taken to guarantee melting of the paraffin before any paraffin filling or emptying steps begin.

- The ATP™ has 2 stainless steel baskets of identical dimensions. Each of the baskets can hold from 125 cassettes (using the appropriate spring organizers) up to 150 cassettes (without using spring organizers). The processing capacity therefore varies from 250 cassettes (with organizers) up to 300 cassettes (without organizers).

  Spring separators are recommended when processing medium to large tissue samples to allow for good fluid exchange. Separators also impede the opening of the cassettes when processing a small number of samples.

3.2 – FRONT VIEW



3.3 – Rear Panel & Floppy Drive

On the rear panel of the control module there are:

A = On/Off main switch

B = Main power connection module

C = Fuse holder (2 x 10A fuses)

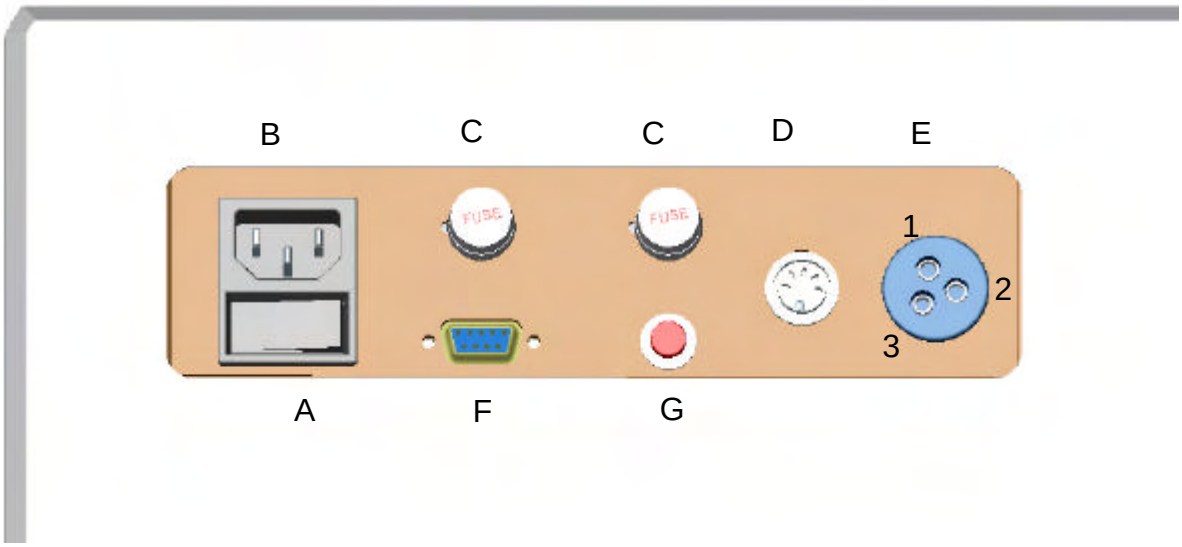
D = Keyboard Connector (for use by service technicians)

E = Remote Alarm socket:
No alarm = pins 1-2 closed, pins 1-3 open
Alarm = pins 1-2 open, pins 1-3 closed

Please note: *The socket at "E" is a low voltage connection (maximum 48V, 6A) isolated from the rest of the instrument. An Auto Dialer or other external alarm notification device can be connected here. The device must output less than 48V, 6A or it will damage the alarm relays.*

F = RS-232 serial port

G = Reset button



Floppy Drive

The 3.5" floppy drive on the side of the ATP™ is only used by service technicians to update the software.

CHAPTER 4 – REAGENTS

4.1 – COMPATIBLE REAGENTS

The following reagents can be utilized in the ATP™ **without** any risk of damage:

- Water
- Formalin
- Ethyl alcohol (pure or denatured)
- Methyl alcohol
- Isopropanol
- Butanol
- Xylene
- Toluene
- Paraffin Wax

The following materials are used in the construction of the ATP™. Reagents other than those listed above can be utilized in the instrument if they **DO NOT** damage the materials listed:

➢ Stainless steel	Rotating valve, Retort and lid
➢ Teflon	Rotating valve, air pump
➢ Kynarflex	Reagent pipes
➢ Viton	Membranes
➢ Glass	Vapor trap
➢ HDPE	Paraffin and reagent bottles
➢ Nylon	Connectors
➢ Tygon	Air pipes
➢ Nickel-plated brass	Air connectors, solenoid valves

The manufacturer is **NOT** responsible for damages due to the use of reagents **NOT** listed here.

4.2 – INCOMPATIBLE REAGENTS

Below is a short list of well-known reagents that **CAN DAMAGE** the instrument. This list is **NOT** complete. Before using reagents not explicitly noted in this manual, please contact TBS® technical service for assistance.

- Acetic Acid
- Acetone
- Amyl acetate
- Benzene
- Bouin's fixatives
- Carnoy's fluid
- Carnoy-Lebrum fluid
- Cedarwood oil
- Chloroform
- Dioxane
- Ethyl ether
- Flemmings Strong
- Gendre fluid
- Helly's fluid
- Little's alcoholic lead
- Olmacher fluid
- Osmic acid
- Paraformaldeide
- Perfix
- Petroleum ether
- Picric acid
- Rossman's fluid
- Tetrahydrofuran
- Trichloroacetic acid
- Trichloroethane
- Weigirt lodine
- Zambini's PAF
- Zenkers

The manufacturer is **NOT** responsible for damages due to the use of the above stated reagents.

WARNING: ***DO NOT*** *use Acetone, Benzene or Trichloroethane. We also advise against the use of fixatives containing mercury salts, acetic or picric acid as they may corrode the metal components of the instrument and shorten a component's useful life.*

CHAPTER 5 – INSTALLATION AND OPERATIONAL QUALIFICATION

This procedure describes the steps for installation and testing of the basic mechanics of the unit and should be done on all new units or units returning from factory service.

1. Position the unit on a flat level surface away from heat (radiators, stoves, direct sunlight, etc.) and moisture (sinks, drains, etc.).

2. Connect the unit to a power source. The main power supply connection must provide (depending on the model):

   110 VAC +/- 10%; 60 Hz; 10A; **grounded**

   220 VAC +/- 10%; 50 Hz; 6A; **grounded**

In addition to the ATPä anti-blackout feature, an uninterruptible power supply (UPS) can be utilized to provide power for short power outages and some protection against power fluctuations, line noise and power spikes. Use of a UPS is highly recommended for sites which experience "brown-outs" or other power fluctuations.

The use of adapters to plug in more than one instrument to the same outlet (power strip) does not provide a reliable power supply. It may produce overheating and create a potential fire hazard. ECC electrical instrument directives forbid such practices.

3. Turn the power on.

4. Select the preferred Language on the initial screen.

5. From the **Main** screen select **Service/ Edit Setup**. Set the elevation to the appropriate value for the location of the laboratory. (See Chapter 12 for more details.)

This is particularly important for higher elevation location. Failure to set the elevation could result in short fill and pressure errors.

6. Choose your Alarm settings.

7. From the **Main** screen select **Service/ Pressure Test.** Perform a pressure test to confirm the operation of the pumps and sensors associated with the pressure system.

8. From the **Main** screen select **Service/ Vacuum Test.** Perform a vacuum test to confirm the operation of the pumps and sensors associated with the vacuum system.

9. From the **Main** screen select **Service/ Retort Heating.** Perform a Retort heating test.

CHAPTER 6 – PREPARATION FOR OPERATION

6.1 – FILLING REAGENT BOTTLES

The emptying and subsequent refilling of reusable reagent bottles must be done in accordance with all safety regulations for handling flammable and toxic substances. Use proper ventilation and keep away from open flames and/or electrical circuits.

1. Place bottles on a flat level surface for filling. All Bottles **must** be filled to the level indicated by the markings on the bottle (between the Min and Max marks):

   MIN = 2.5 liters, MAX = 2.75 liters.

Failure to fill to the correct level can result in errors and alarms.

2. Inspect the Quick connect O-rings and inspect the internal tubing connection to ensure there are no cracks or defects, and that the O-rings are clean.
3. Inspect the openings in the Quick connect to make sure there are no clogs or obstructions.

When exchanging or refilling bottles, use the special screw-caps supplied with the instrument to avoid reagent spillage and fumes. ***Replace cracked or damaged caps and O-rings.***

4. Secure the cap around the Quick connect, and the solid cap.

DO NOT OVER-TIGHTEN. This can result in cracking of the caps.

If the quick connect couplers leak, the o-rings should be replaced. If leakage problems persist, contact TBS® customer service.

6.2 – FILLING PARAFFIN BOTTLES

The ATP™ tissue processor is unique in that the same bottles are used for paraffin and reagents. Paraffin bottles are placed in a special heating chamber that maintains a constant temperature of (54-60° C). There are 5 paraffin bottle stations. The slot labeled as "**R**" contains a spare bottle which can be used for immediate replacement of a contaminated or dirty bottle.

Follow the steps outlined above for inspection and filling of the Paraffin Bottles**.**

*Bottles **must** be filled with **melted** paraffin to the level indicated (between the Min and Max marks) whereas: MIN = 2.5 liters, MAX = 2.75 liters.*

Use of a paraffin dispenser such as the TBS® Paraffin Dispenser (Catalog No. PD) makes filling of bottles simple and convenient.

***DO NOT** use paraffin that is not completely melted. It can result in a clogging of the tubing. Attempting to fill the bottles with flakes frequently results in an over or under fill condition that will cause a blocking alarm. (See Chapter 7 for alarm listings.)*

***WARNING:** Since the normal paraffin temperature approaches the level at which a first-degree burn may be possible, we recommend to always wear protective clothing, gloves and eyewear when handling bottles of liquid paraffin.*

Always cap open paraffin bottles immediately after they are removed from the paraffin heating chamber.

The paraffin heating chamber door is insulated and must be kept closed except when removing or replacing bottles.

The ATP™ Paraffin Wax Purification cycle removes xylene from the paraffin by drawing a vacuum on the wax bottles. When particulate build-up occurs in the wax, the wax should be replaced.

Paraffin waxes tend to leave residues that, if not removed, may cause damage to the instrument. Regular paraffin changes are essential for optimum processor performance.

WARNING: *Never leave a slot without a bottle; the bottles should always stay in their slots with their normal paraffin level of 2.5 lt. The absence of one bottle may cause an incorrect heating of the other bottles.*

As with all tissue processors, good processing quality requires that certain guidelines be followed:

- For a large quantity of samples, or very large specimens, the reagents will need to be replaced more often
- Larger specimens require longer times at each station
- The use of vacuum (or pressure/vacuum cycles) and reagent heating in each step of the process improves infiltration.

The daily replacement of the most contaminated reagent, with subsequent "scaling" of the remaining reagents, is preferable to the weekly substitution of all reagents. In this way, the process quality remains constant; while in the latter method process quality varies from a maximum (with all new reagents) to a minimum (last process before all reagents are replaced). The ATP™ Reagent Management System (**RMS**) will optimize the "scaling" process because the **RMS** eliminates having to move the least contaminated reagents into adjacent slots. The **RMS** automatically selects the most contaminated reagent first and the least contaminated reagent last. For a more detailed explanation, refer to Chapter 9.

6.3 – INSTALLING CHARCOAL BOTTLES

1. Remove the Solid Cap
2. Remove the tape covering the vent hole, or punch a hole in the tape, making sure that the opening is fully open to allow the Charcoal to vent properly.
3. Place the bottles in the 2 right most positions of the Reagent chamber, one on each level. Make sure the bottles are firmly positioned and properly seated.

CHAPTER 7 – FIRST RUN PROGRAMMING

7.1 – INTRODUCTION

Prior to running the unit for the first time, there are a number of custom settings that should be set by the Supervisor.

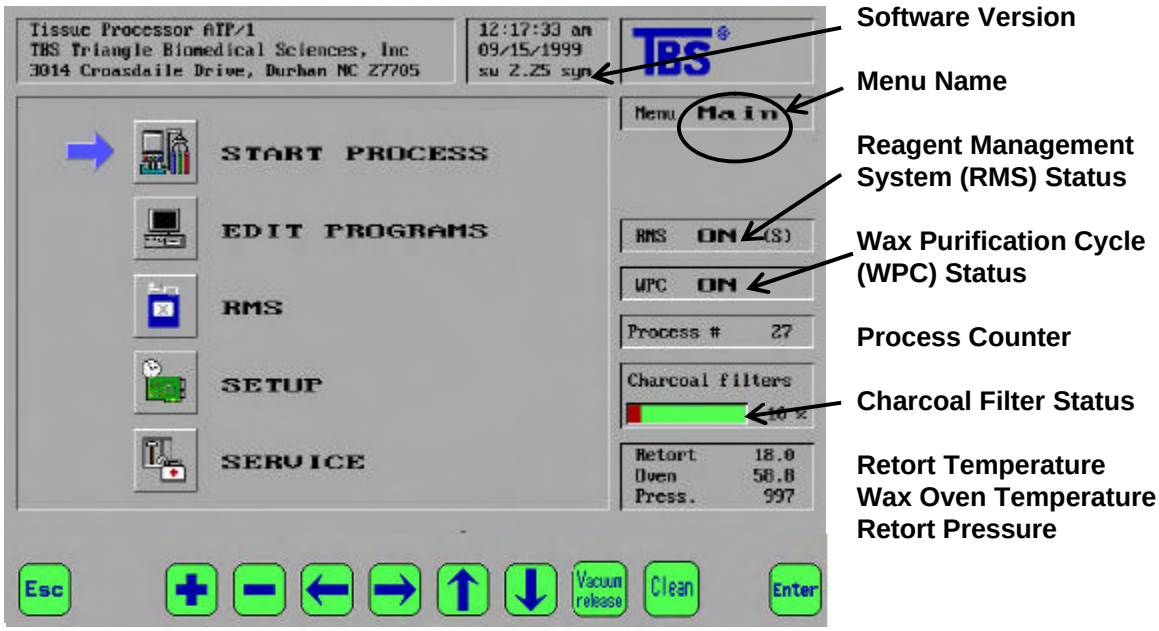
- **Reagent Names**: The list of available reagents contains default identifications for quality assurance testing. The user can add the names of other reagents to this list that are appropriate for their laboratory.
- **Hour & Date**
- **Program Name and Program**

7.2 – LANGUAGE

Choose the preferred language for the laboratory.

7.3 – MAIN MENU

This is the **Main Menu**:



At the bottom of the screen are buttons used for navigation:

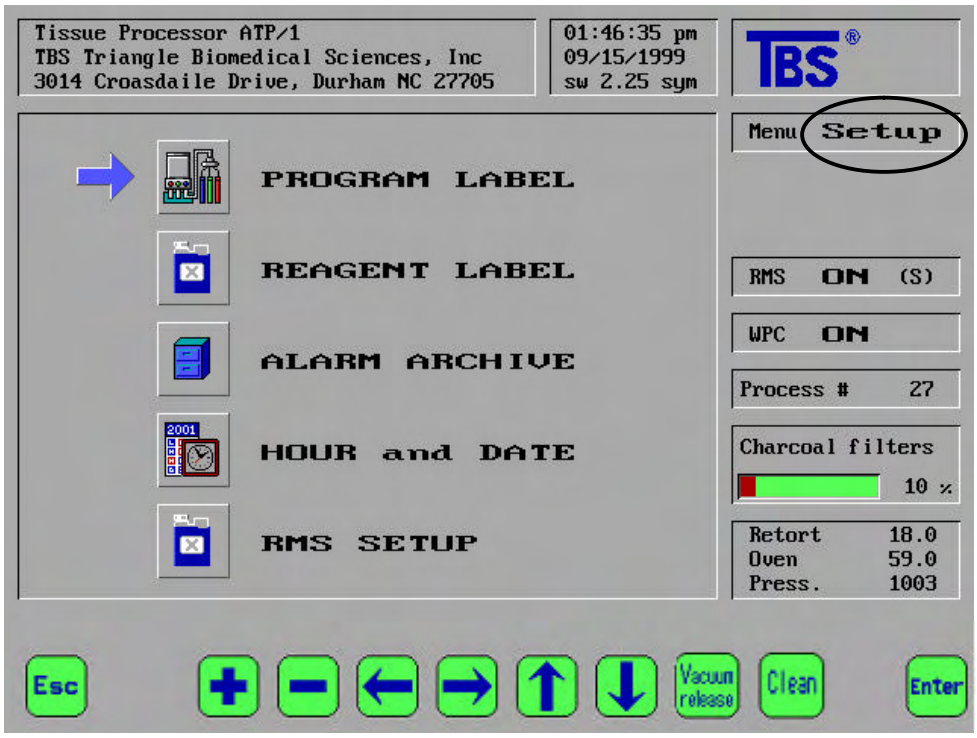
ENTER	Data confirmation, process starting, menu selection, etc.
+	Increase of numerical values and other parameters
-	Decrease of numerical values and other parameters
¬ ® - ¯	Cursor movement through the menus and the program displays
VACUUM RELEASE	Vacuum release in the Retort
CLEAN	Retort washing (Purge Cycle)
ESC	Back to main menu, stop process, etc.

Above the buttons, two message lines display information for the correct use of the instrument. These messages show the processing status and any actions that must be performed (not displayed in the image above since no process has been programmed). The indications contained in these messages must be carefully followed especially during start-up and the execution of Processing Programs and Purge Cycles.

All process data are displayed in the central part of the screen both during programming and execution.

7.4 – REAGENT LABELS

From the **Main Menu**, select **SETUP** to access the **Setup Menu.**



Choose REAGENT LABEL.

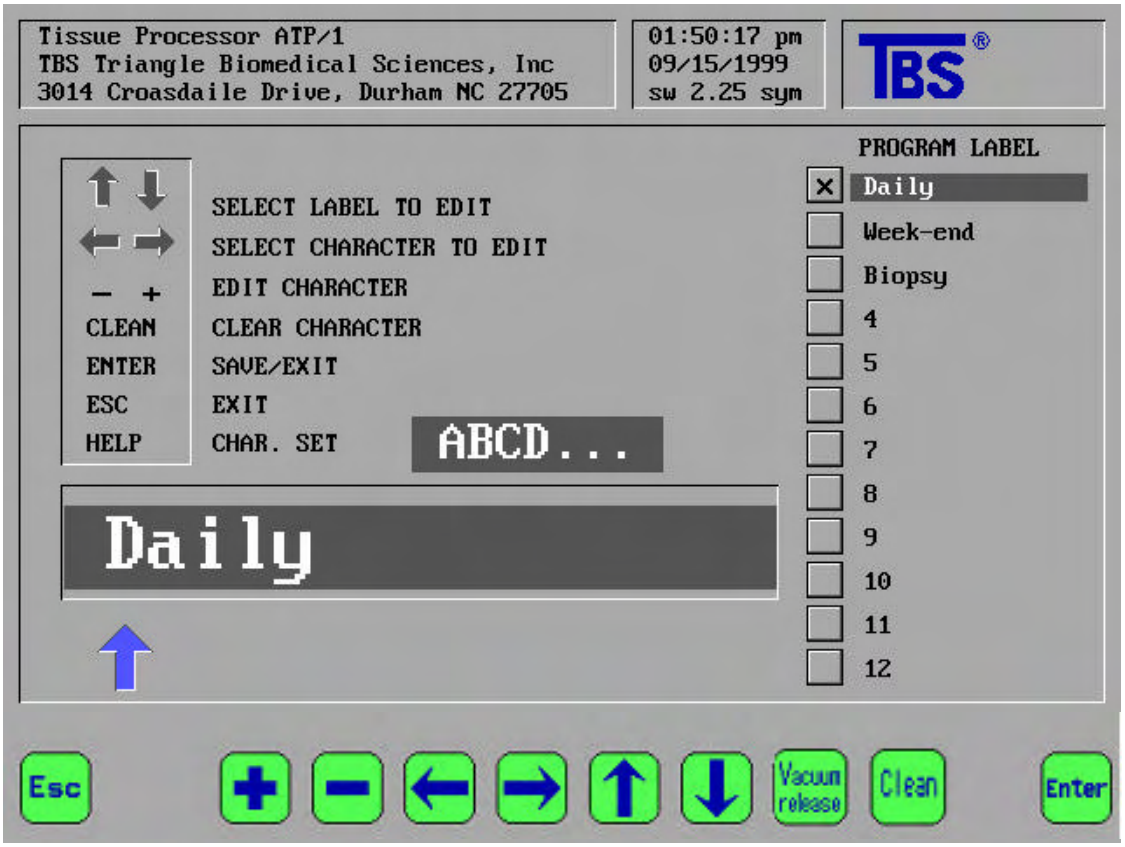
Reagent names must be defined before they can be used in a program. Up to 12 different reagent names can be defined.

Use - and ¯ arrows to select the position (name) you wish to edit.
Use ® and ¬ arrows to select the letter you wish to change or add on.
Use **+** and **-** to access the alphabetical list until the letter you want is displayed.
Use **VACUUM RELEASE** to select upper-case, lower-case and numbers.
Use **ENTER** to confirm and save changes.
Use **ESC** to abort the operation. All the changes will be lost.
Use **CLEAN** to create blank spaces.

It is not necessary to confirm with **ENTER** each single name or letter change. After modifying one or more letters of a name, switch to another name or letter using the arrow keys and then confirm with **ENTER** all the changes simultaneously.

7.5 – PROGRAM LABEL

Program names must be defined before the program can be defined or edited. Up to 12 different program names can be defined.



Use - and ¯ arrows to select the position (name) you wish to edit.
Use ¬ and →arrows to select the letter you wish to change or add on.
Use **+** and **-** to access the alphabetical list until the letter you want is displayed.
Use **VACUUM RELEASE** to select upper-case, lower-case and numbers.
Use **ENTER** to confirm and save changes.
Use **ESC** to abort the operation. All the changes will be lost.
Use **CLEAN** to create blank spaces.

It is not necessary to confirm with **ENTER** each single name or letter change. After modifying one or more letters of a name, switch to another name or letter using the arrow keys and then confirm with **ENTER** all the changes simultaneously.

7.6 – HOUR AND DATE

Select **HOUR and DATE** from the S**etup Menu**.

The **Hour and Date Screen**:

With the arrow keys, point the cursor at what is to be changed, then increase or decrease its values with the **+** and **-** keys.

Press **ENTER** to save changes and to go back to the previous menu.

Press **ESC** to abort changes and to go back to the previous menu.

7.7 – PURGE REAGENTS LIMITS SETTING

Access these settings via **SETUP/RMS**. The reagents for the Purge Cycle are managed by the **RMS**. It is necessary that the **RMS** be active in order to receive reminders to substitute the Purge reagents every 3 to 9 processes. The recommended numbers of processes which can be performed before the substitution of the Purge reagents are as follows:

- Cleaning only the retort: 9 processes or less
- Cleaning the retort and the baskets: 5 processes or less

These recommendations are valid for the correct use of the instrument. However, they are contingent upon the manual removal of as much residual paraffin as possible (from the lid and retort) before beginning the Purge cycle.

Please note: *if the user desires to replace the Purge reagents before their counter reaches the preset limit, it will be necessary to reset the counter by the "Zero Resetting Single Counter" function*.

7.8 – CCW (PARAFFIN OVEN) TEMPERATURE SETTING

When the ATP™ is delivered to your location, the temperature of the CCW (stations 11 to 14) is preset to the default value of 60°C. This default can be modified in the Other Settings /Functions section of the RMS Setup menu. The allowed temperature range for paraffin in the CCW is from 50°C to 60°C.

At the start of any process, the default temperature of the CCW is reset to be the same as the retort temperature set for the paraffin waxes in that process (if they differ). At the end of a process, the CCW temperature will return to the default value selected in the RMS Setup menu.

It is important to note that if the instrument is completely reset (as explained in Chapter 7 – Alarms) this default CCW temperature will return to 60°C.

7.9 – CHARCOAL FILTER LIMIT SETTING

The charcoal filters are consumable items administered by the **RMS**. The percentage indicator (amount of usage) is visible on the **MAIN** and **SETUP** menus (with 0% representing a new filter and 100% representing an expended filter). When the filters reach or exceed their preset limits, the **RMS** will prompt the user to replace them at the same time they are prompted to replace reagents.

The charcoal filters should be replaced anytime after 60 processes but under no circumstances more than 120 processes based upon the following factors:

- Without use of the **WPC,** replace every 90 to 120 processes.
- With use of the **WPC,** replace every 60 to 90 processes.

These values are somewhat approximate because they can vary due to:

- Environmental factors (humidity, temperature)
- The duration of the processes
- The application of vacuum (or pressure) on all the processing steps
- The frequency of agitation of the reagents

If you are operating the ATP™ in an area with high relative humidity, if you run long processes frequently, if you apply pressure and/or vacuum to most or all of the process steps, if you agitate the reagents in the retort frequently, and especially if several of these factors apply to your usage, it will be necessary to set your process number limits for the charcoal filters at or below the minimum values mentioned above.

Important note: *If you replace your charcoal filters before the process counter reaches your preset limit, you must reset the counter with the "RMS Single Counter Reset" function on the RMS Setup menu. If this becomes a common practice, please edit you process limits for the charcoal filters.*

7.10 – WPC (WAX PURIFICATION CYCLE) ACTIVATION / DEACTIVATION

Use of the **WPC** will reduce your consumption of paraffin by approximately 50%. The system is able to reduce paraffin consumption by removing the preceding reagents that would be introduced by cross-contamination. This removal is accomplished by a flow of air bubbled through the paraffin containers. The volatile reagents evaporate due to the heating of the paraffin containers during the **WPC** process. The air bubbled through the paraffin carries these reagent vapors through the charcoal filters where they are trapped. Use of the Paraffin Wax Purification Cycle, while it will reduce consumption of paraffin waxes, will also shorten the estimated life of the charcoal filters.

The duration of the Paraffin Wax Purification Cycle is about 30 minutes.

*If the **WPC** option is activated, it will begin automatically after each Purge cycle, but only when paraffin has been used in the preceding process.*

It is always possible to manually run a Paraffin Wax Purification Cycle from the **RMS** Setup Menu, independent of paraffin usage in the previous process. During the **WPC** the paraffin waxes are not transferred from their containers; the retort will stay clean and it will not be necessary to start a Purge cycle after the **WPC**.

*During the **WPC**, the retort lid must **always stay closed**.*

The activation / deactivation of the **WPC** takes place on the RMS Setup menu. The **WPC** should be activated for optimal performance.

Deactivation of the **WPC** is advisable when:

- An excessive consumption of the charcoal filters makes its use less than economical for the user. This could occur due to a combination of the environmental and usage factors mentioned above.

- The instrument is malfunctioning frequently. Discontinuing use of the **WPC** lowers the workload on the ATP™ and eliminates one possible source of malfunction. This in turn assists service personnel in diagnosing the instrument's problem.

7.10.1 – MANUAL START OF THE WPC

If for any reasons the **WPC** has been interrupted or not allowed to start automatically, it can be started manually by selecting the "Start Paraffin Wax Purif. Cycle" line on the RMS Setup menu. It is important that the **WPC** is started only after running a Purge Cycle following a process.

7.11 – RMS ACTIVATION

The **RMS** (Reagent Management System) can be activated or deactivated prior to running a program.

See Chapter 9 for details on the use and setup of the **RMS**.

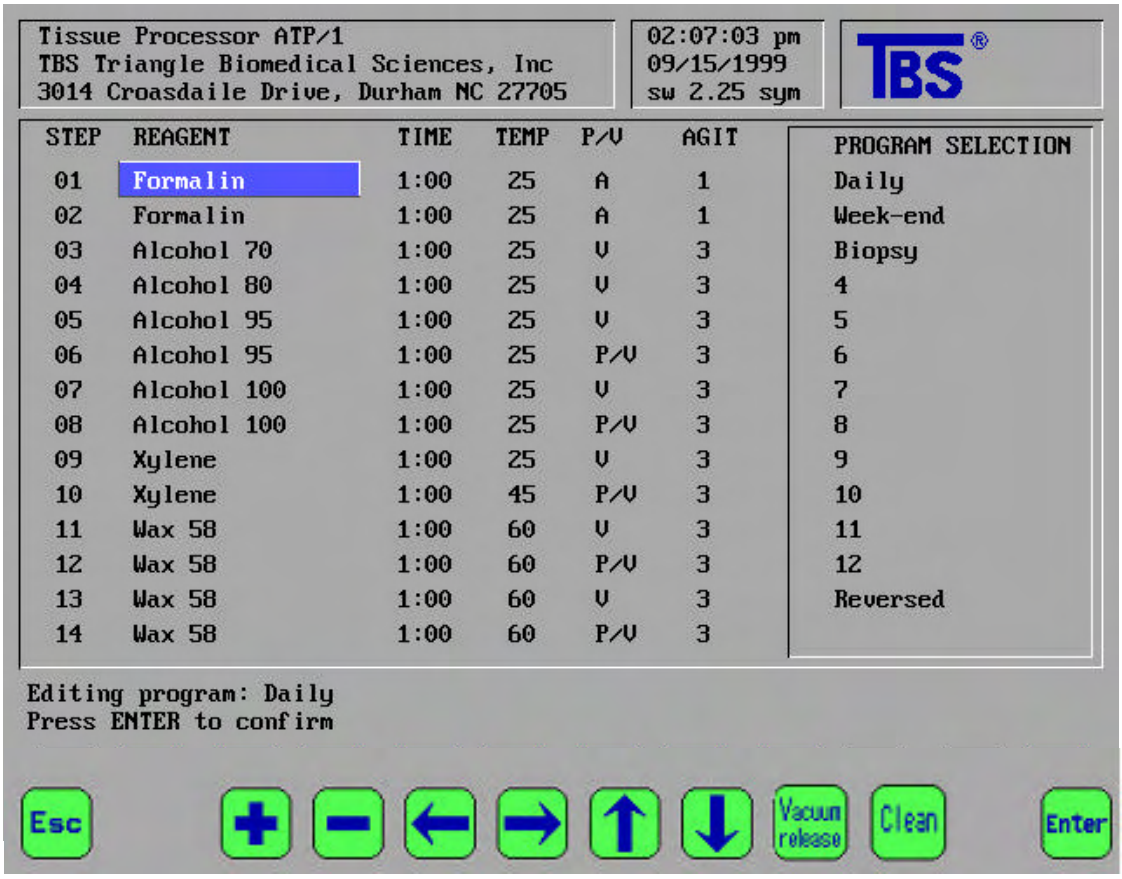
CHAPTER 8 – PROGRAMMING PROCESSES

8.1 – PROGRAMMING PROCESSES

To define new or edit existing programs, the Program Label must exist, and any reagents to be included in the program must already be defined.

1. Select **EDIT PROGRAMS** from the **MAIN** menu.
2. From the menu on the right side of the screen, use the arrows to select which program you would like to edit. Once highlighted, press **ENTER**

The **Edit Programs Screen** will appear.



Use - and ¯ arrows to select the process to edit/change.
Use **ENTER** to start editing the selected process.
Use the **ARROW** keys to move through the process data: Reagent name, Processing Time, Temperature, Pressure/Vacuum and Agitation.

When in the field to edit or change, use **+** and **-** keys to change values.
Press **ENTER** to save changes and to go back to the previous menu.
Press **ESC** to abort the operation and to go back to the previous menu.

Reagent

Reagent names are labels prepared in advance. They do not have an influence on the process. They are listed for the convenience of the user so that you can define which solutions to use for each step

Time

The time for each step can be set from 0 to 12 hours, in 5 minute intervals. If a time of 0 hours and 0 minutes is set, the step will be ignored even if the other parameters (temperature and vacuum) are set. The time includes the reagent filling and emptying process.

Temp

The selectable reagent temperature range is: Ambient - 45° C
The selectable paraffin temperature range is: 52 - 60° C

P/V

The Pressure/Vacuum **P/V** field allows you to select the following options:

A = ambient pressure
V = vacuum approx. 700mBar below ambient
P = pressure approx. 250mBar above the ambient pressure
P/V = an alternating cycle with an 8 minute frequency of pressure and vacuum

Varying the pressure in the Retort facilitates reagent infiltration into tissue specimens. The following **P/V** settings are recommended:

Biopsies = vacuum or ambient pressure
Samples of normal size = vacuum in every station
Mix of biopsies and normal samples = vacuum in every station
Large samples = cycles of pressure and vacuum in every station

It is never recommended to simultaneously process samples of vastly different sizes.

Agit

The reagent agitation in the ATP™ is accomplished by bubbling air up from the bottom of the Retort. Select from the following frequencies:

0 = no agitation
1 = an agitation every 30 minutes
2 = an agitation every 20 minutes
3 = an agitation every 15 minutes
4 = an agitation every 10 minutes
5 = an agitation every 5 minutes

Each agitation cycle lasts 10 seconds.

Actual dye dilution studies indicate better reagent mixing throughout the retort (from top to bottom) with air bubble agitation than conventional magnetic stirring.

8.2 – PROCESS # 13: REVERSED

REVERSED possesses all the characteristics of the other programs except:

- It begins at the last non-zero time on the steps list and moves backwards (**REVERSED**).
- It is not possible to insert a delay on the first step.
- The operator cannot modify its name.
- Its position in the list of the processes is always #13.

Except as specified above, it is identical to the other processes, therefore:

- It increments the **RMS** counter by one process.
- All **RMS** rules are respected.
- At the end of the process, user will be prompted to run a Purge Cycle.
- At the end of the Purge Cycle, if during the last process at least one paraffin used, the **WPC** will automatically be started.
- At the end of the **WPC**, the Reagent Management System will be started.

There are no particular restrictions to the use of this process, however be aware that the reagent contamination will also be reversed.

Under normal conditions this process would rarely be selected, as it serves primarily to unprocess samples of poor quality, therefore it will not substantially influence reagent concentrations.

CHAPTER 9 – REAGENT MANAGEMENT SYSTEM (RMS)

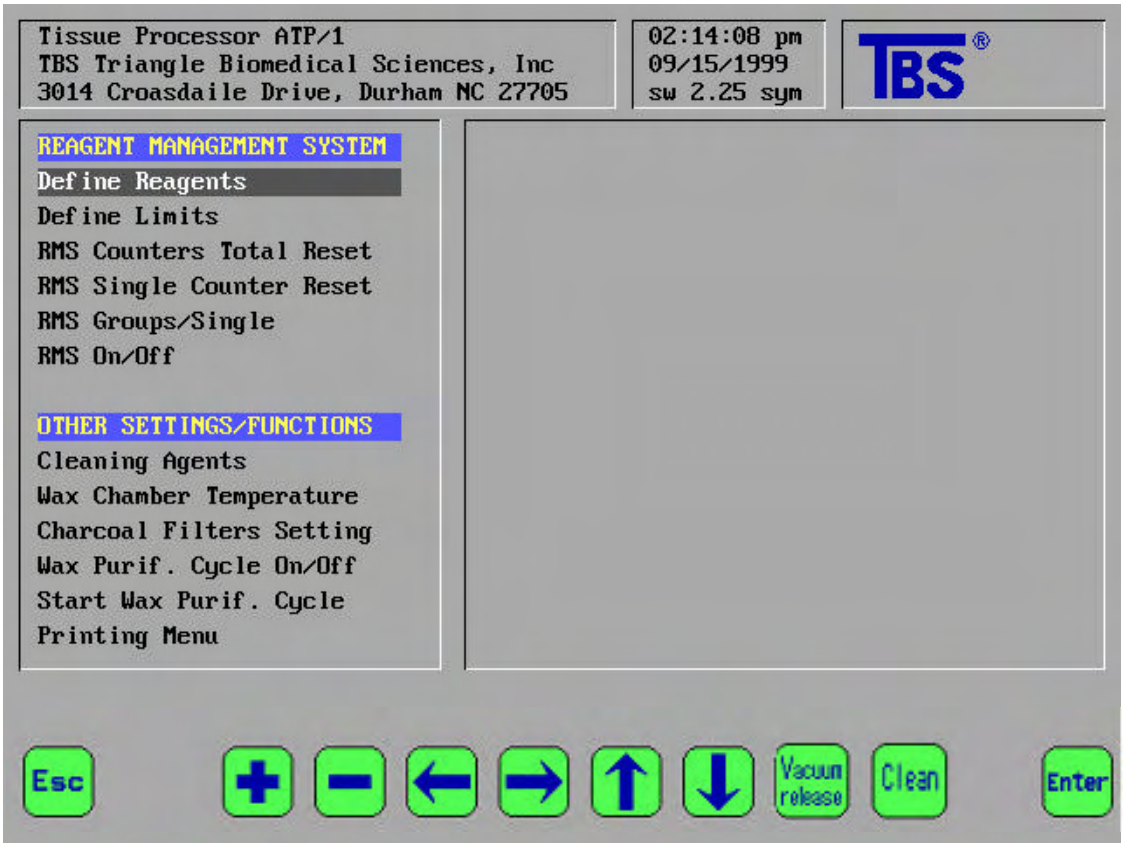
9.1 – INTRODUCTION

The ATP™ **RMS** is a system to punctually and exactly manage all reagents to enhance processing consistency and improve sample quality.

The use of the Reagent Management System provides quality assurance documentation of reagent bottle status. This results in substantial time savings and reduces the possibility of errors when multiple operators use the instrument.

When activated, following the Purge cycle (and the **Wax Purification Cycle,** if activated), the system will automatically prompt the user to replace the reagents that have reached their user-defined pre-determined processing limit.

Access the **RMS Setup Menu** by choosing **SETUP/RMS**.



9.2 – CHOOSING THE RMS MODE

This will allow you to select either of the following two functions:

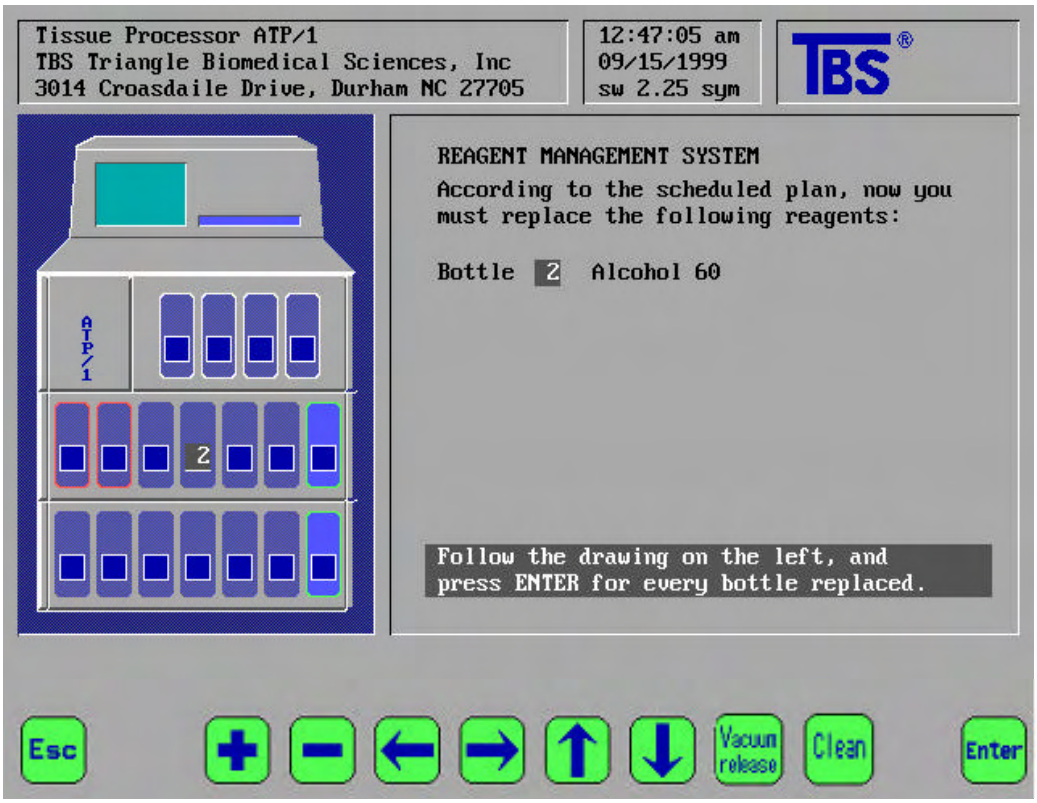
- **Single Bottle mode:** In Single Bottle mode, each bottle is managed as a separate entity, therefore, each bottle will have a defined limit usage and will be defined by the specific type of reagent it contains. In this mode, the number that identifies the physical position of the bottle in the processor always corresponds with the program step number. It is important to understand this operation of the processor and of the **RMS**. Unlike the Group Mode, in the Single Bottle Mode the program step # and the identification # of the bottle are the same, plus, the reagent is identified by its specific name (i.e. 70% alcohol, xylene, etc.).

- **Group mode:** The intent of the **Group** mode is to automate the reagent management process that is performed manually in many laboratories. The physical shifting of the bottles by the operator is **not** necessary because the ATP™ automatically changes the order of use of the bottles in relation to the prior usage of the reagent. In the Group mode, reagent bottles are managed as a group based on the type of reagent contained in the bottles.

*The **RMS** automatically keeps track of the number of processes performed and the total number of cassettes processed. Changing the **RMS** mode will reset the counter to zero, therefore, it is recommended that **all reagents are replaced prior to changing the RMS mode.***

9.2.1 – RMS SINGLE MODE DESCRIPTION AND EXAMPLE

The **RMS – Instructional Screen** indicates what action to take.



As explained in previous sections, at the end of each process and after the completion of the **WPC** (when active), the Reagent Management System will activate a screen like the one shown above. This screen provides written instructions and a graphical representation of the ATP™, showing which reagent bottles to replace and the specific reagent to use.

If, for some reason, it is necessary to postpone the substitution of reagents after a process, it is possible to press the ESC key, skip this session of the **RMS** and postpone it until the end of the next process.

Please note: *The process limit counters are not reset by this action. At the end of the next process, the **RMS** will prompt the user to replace the reagents that expired at the end of the previous processes plus those whose limits have been reached after this most recent run.*

If the **RMS** is skipped at the end of a process using the **ESC** key as explained above, scheduled reagent replacement can be performed without waiting to complete another process. By choosing to enter the **RMS** menu from the Main Menu, you will automatically be prompted to press enter to start **RMS** operations.

Conversely, if the **RMS** has been regularly executed, any request for execution from the Main Menu will be denied.

9.2.2 – RMS GROUP MODE DESCRIPTION AND EXAMPLE

This mode facilitates maintenance, management and quality assurance by:

- Managing the bottles by user defined classification of the reagent.
- Recording the usage of each solution by number of runs and/or cassettes.
- Reminding to replace reagents that have reached their defined limits.
- Automatically selecting the proper order depending on the usage of each reagent within the specified group.

In the group mode, the specific reagent name is not used to identify the contents of the bottle, but, it is classified as part of a group of similar reagents. The position number of a reagent bottle does not correspond to the program step number with the exception of the following:

- The first time the processor is used in **Group** mode
- Each time the counters are reset to zero (**RMS** resetting)
- Intermittently, when the relationship between the number of bottles in the group and their individual limits is such that the position number is the same as the bottle number (see the sequencing example that follows for more detail)

In summary, in order to properly utilize the **Group Mode** function:

1. Activate the **RMS** in **Group** mode.
2. Define groups of reagents by their function or contents.
3. Define the limits, in terms of processes and/or samples for each group.
4. Replace the reagents as indicated.

Example Group Mode Sequence

High grade dehydrants are placed in bottles 6, 7 and 8.
The limits of this group are fixed as 1 process.

The sequence of use would be the following:

STEP	USAGE
PROCESS # 1	
6	Bottle 6 (fresh reagent)
7	Bottle 7 (fresh reagent)
8	Bottle 8 (fresh reagent)
Prompt to replace bottle 6	
PROCESS # 2	
6	Bottle 7
7	Bottle 8
8	Bottle 6 (fresh reagent)
Prompt to replace bottle 7	
PROCESS # 3	Prompt to replace bottle
6	Bottle 8
7	Bottle 6
8	Bottle 7 (fresh reagent)
Prompt to replace bottle 8	
PROCESS # 4	
6	Bottle 6
7	Bottle 7
8	Bottle 8 (fresh reagent)

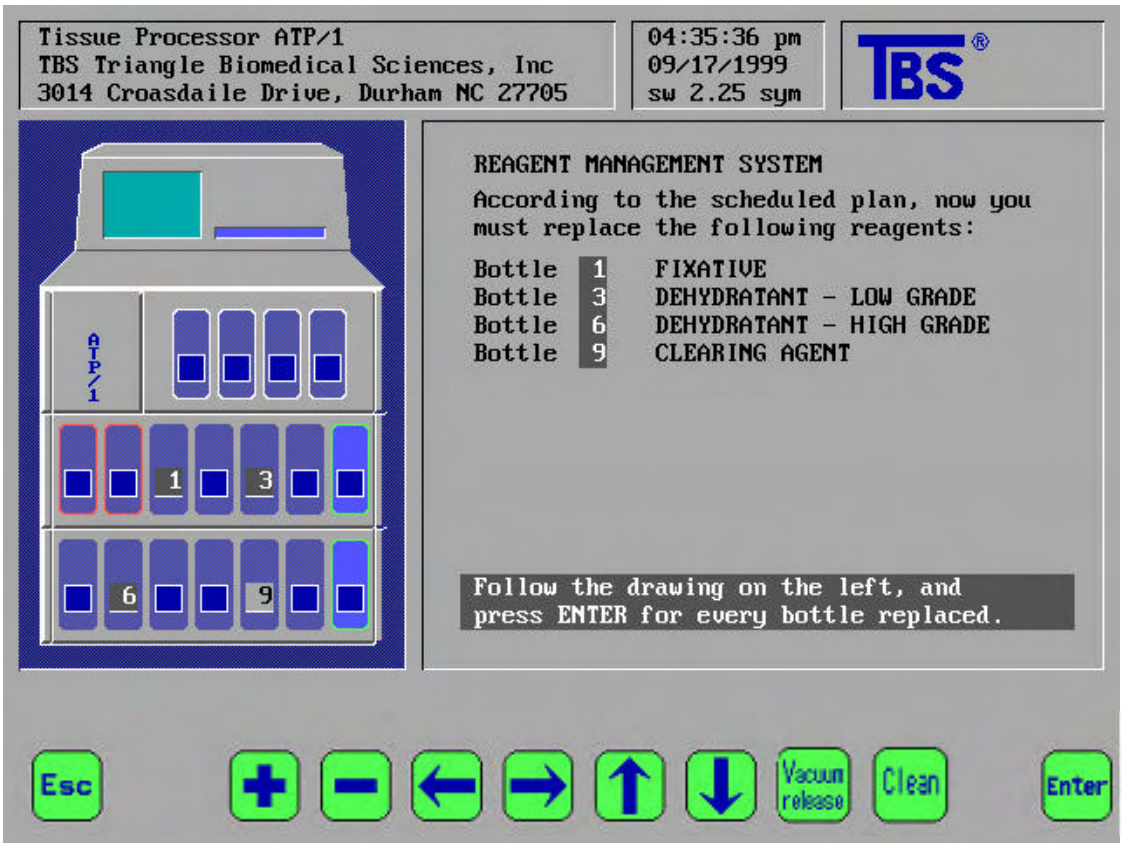
Since the limit is set at 1 process, the user will be prompted to change the most contaminated bottle in the set, the first bottle, following the first run. The second bottle is then accessed first on the next run, and would become the next bottle to be replaced.

In this example, for process #4, the reagent group sequence will correspond again to the physical position of the bottles and to the step of the program. For the paraffin group (that is composed of 4 bottles), the frequency of a return to the physical order is 4 processes.

Understand that when the **RMS** is operating in **Group** mode, neither the physical position of the bottles nor the step of the program when selecting a reagent will be relative to the cumulative usage of the reagent. The instrument will provide instruction for the reagent substitution and it will be essential to follow the instructions exactly.

The processing results will be the ultimate indicator as to whether the **RMS** settings are ideal. To correct inadequate infiltration replace all the reagents, use the counters reset functions to set the group counters to zero and decrease the process/cassette number limits. Alternately, excellent results may indicate that the limits could be increased **slightly**, extending the life of the reagents.

The **RMS Instructional Screen** indicates what action to take.



Similar to Single Bottle mode, at the end of a process the **RMS** will prompt the user with graphics and text to replace a reagent bottle from one or more groups. This task may be postponed to a later time by pressing the **ESC** key in the same manner mentioned above, and, may be executed at the end of the next process or accessed from the Main Menu.

*When there are multiple concentrations belonging to a group such as the DEHYD groups, the **highest** concentration solution should be utilized to replace the reagent in the bottle.*

9.3 – RMS – PROGRAMMING REAGENTS DEFINITION

Defining reagents allows the operator to identify the type of reagent that is utilized in any single bottle. The labels utilized are the same as those assigned in the process programming section (Chapter4) and that are prepared/modified from the **SETUP Menu** with the function **Reagent Label**.

Please note: *When using the RMS, the assignment of a reagent name to a bottle, does not automatically update the reagent names in the process programs*.

The way the reagents are defined depends on whether the RMS is operating in **SINGLE** mode or **GROUP** mode.

Single Mode

The content of each bottle needs to be defined by highlighting the bottle position and using the **+** and **–** keys to scroll to the correct reagent name. Once the correct name is indicated, use the ¯ arrow key to proceed to the definition of the next reagent bottle.

Group Mode

The contents of each bottle are classified according to the type of reagent, not the specific reagent. Thus each position needs to be defined as one of the following classes of reagents.

- **FIXATIVE:** Formalin or other similar functioning reagents
- **DEHYD L.G.**: Low Grade Dehydrant such as Alcohol up to 70%
- **DEHYD H.G.**: High Grade Dehydrant such as Alcohol >70%
- **CLEARING**: Xylene or other similar functioning reagents
- **WAX**: Paraffin wax
- **UNDEFINED**

The content of each bottle needs to be defined by highlighting the bottle position and using the **+** and **–** keys to scroll to the correct group name. Once the correct name is indicated, use the ¯ arrow key to proceed to the definition of the next reagent bottle.

The definition of the groups must respect the following rules:

- The groups must be sequenced in relation to their actual use in the processing procedure (i.e., fixative must precede dehydrant, low grade dehydrant must precede those of high grade, etc.).

- Between one group and another there could be bottles of undefined content that therefore are not managed by the automation of the **RMS**. This, however, is unadvisable because it is inconsistent with the goals of the Histology process.

- A group could consist of just one bottle (a typical example is the group of fixatives).

- For the dehydrants there are two separate groups: low and high grade (low grade being alcohols with concentrations less than 70%). If the user desires though, it is possible to have only one group, choosing either low or high grade to represent it, and having the **RMS** manage your alcohols as one large group.

- Bottle positions 11-14 are fixed as the "paraffin" group. If you wish to use the **RMS** to manage your reagents but do not wish to have the **RMS** manage the paraffin waxes for you, it is necessary to set the paraffin process number/cassette number limits to zero.

9.4 – RMS – Programming Limits Definition

The definition of the limits determines the frequency of reagent substitution. It is possible to assign each bottle a limit based on the number of processes performed and/or a limit based on the number of cassettes processed.

When one of the two limits is reached or exceeded, the **RMS** will require the substitution of the reagent for that specific bottle. Again, it is sufficient that **only one** of the two limits is reached. It is possible, however, to use just one of the two limits by setting the other to zero. If both limits are set to zero, the **RMS** will not prompt the user to replace the reagent in that bottle.

Single Mode

The limits of each bottle need to be defined by highlighting the bottle position and using the **+** and **–** keys to scroll to the correct limit for both **CASSETTE** number and **PROCESS** number. Once the correct limit is shown, use the ¯ arrow key to proceed to the definition of the next reagent bottle.

Group Mode

The limits for each reagent type needs to be defined by highlighting the bottle position and using the **+** and **–** keys to scroll to the correct limit for both **CASSETTE** number and **PROCESS** number. Once the correct limit is shown, use the ¯ arrow key to proceed to the definition of the next reagent type.

When defining the process number/cassette number limits for groups of reagents, the same factors that were considered when assigning single bottle limits will be considered here. The difference is that when the preset limit for the group is reached or exceeded, the **RMS** will require the substitution of the bottle whose reagent is the most polluted (the bottle in the group that, in the previous processes, was used first).

9.5 – RMS – COUNTERS TOTAL RESET

The Counters Total Reset selection allows the user to set to zero the number of processes performed and the number of cassettes processed. This function may be used when it is determined that it is necessary to replace/renew the reagents of all bottles and, in effect, restart the **RMS**. The complete zero resetting **does not** include the counters for the charcoal filters or the bottles of the Purge reagents.

Please note: *Resetting the counters to zero occurs automatically when the following functions are selected:*

- *Changing the **RMS** mode (between Single and Group mode)*
- *Each time the **RMS** is activated or deactivated*
- *When the definition and/or limits of the groups are modified*

Please note: *Resetting the counters to zero does **not** occur automatically when modifications to the definition of the reagents or of the limits in Single Bottle mode are made.*

RMS – Single Counter Reset

The Single Counter Reset selection allows the user to zero the counters of individual bottles. This function is useful if the user decides to replace/renew a reagent before the preset limit of a particular bottle is reached.

Please note: *The Single Counter Reset only allows the user to change individual bottle counters if the **RMS** is in Single Bottle mode.*

Please note: *The Single Counter Reset is also the only function that allows the operator to reset the counters of the charcoal filters and the Purge reagents.*

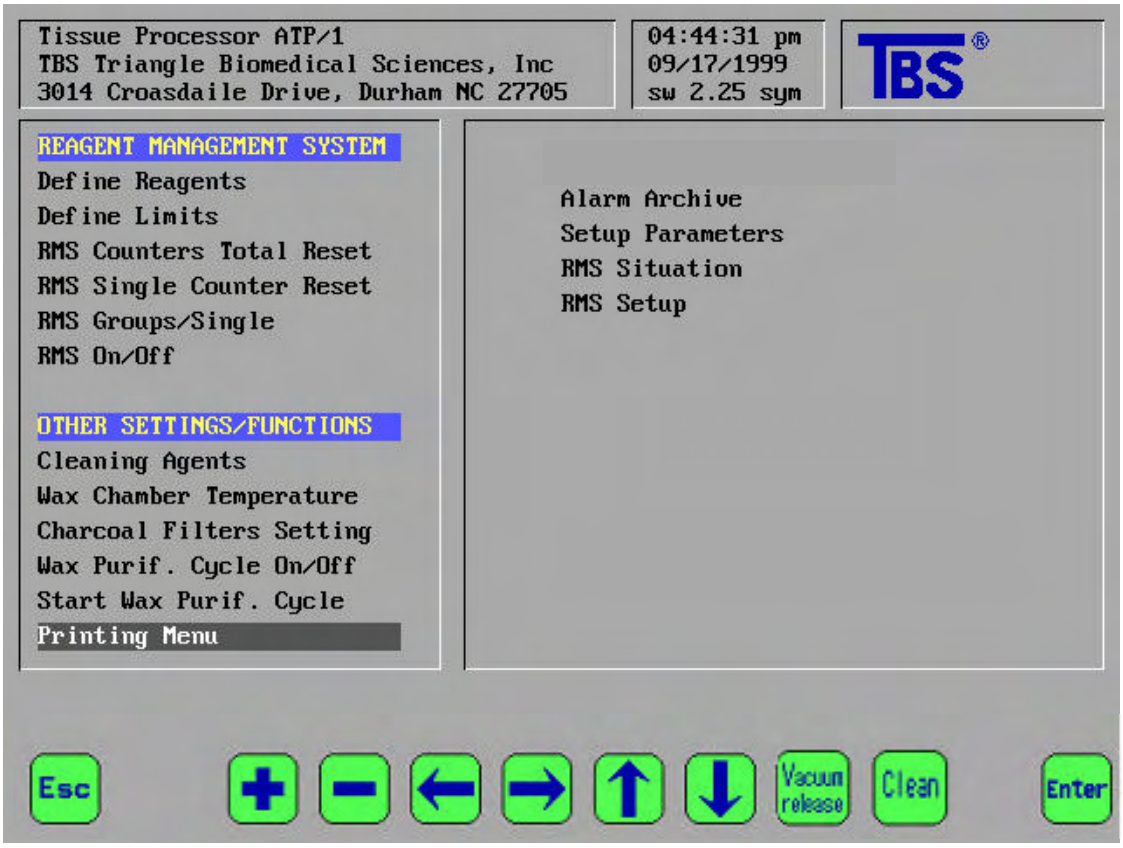
Please note: *The counters of the charcoal filters and Purge reagents are **not** reset by the Counters Total Reset function or a change from Single Bottle mode to Group mode. Whenever the user replaces the Purge reagents or the charcoal filters without being prompted by the **RMS,** it will be necessary to utilize the Single Counter Reset.*

9.6 – RMS On / Off

This function will turn the **RMS** on or off. Changing the **RMS** mode will reset the counter to zero. Again, it is recommended that all reagents be replaced prior to changing the **RMS** mode.

9.7 – Printing Menu

The **Printing Menu**:



From the Printing Menu you may print the following information:

- **Alarm Archive**: Report of the last 100 alarms
- **Setup Parameters**: Various Instrument Setup Parameters
- **RMS Situation**: Status of the **RMS**
- **RMS Setup**: **RMS** settings

It is always advisable to print the **RMS** Setup and general Setup Parameters after any meaningful changes have been made to their values.

A printout of the **RMS** status can be useful if there is some question about the cycle of reagent substitution or if there is some other reason to refresh or exchange some reagents and reset their process/cassette number counters.

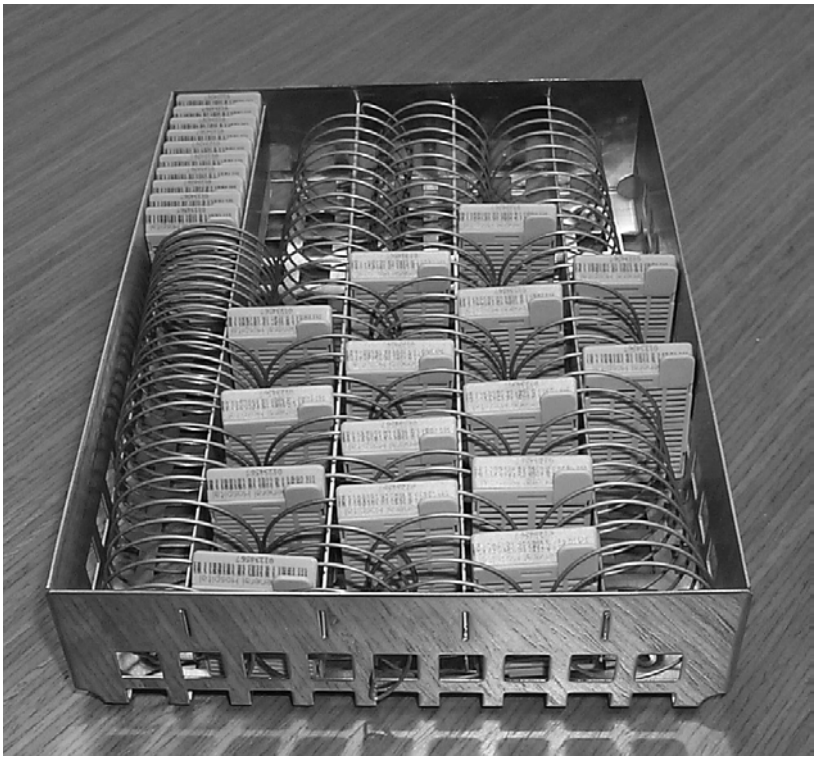
Finally, although the user is asked at the end of each process if they would like to print a report of the process just performed, it can also be printed from this menu.

If you attempt to print with no printer attached, the system will lock up. If this happens, power cycle the unit and then clear the resulting Blackout Alarm.

CHAPTER 10 – NORMAL OPERATION

10.1 – LOADING SAMPLES INTO THE BASKET

The standard sample basket has 4 metal dividers and springs installed to allow cassettes to be organized and to prevent cassettes from opening during a run. The image below shows a number of cassettes loaded using the springs. If you prefer not to use the dividers or springs, they can easily be removed.



It is always a good idea to evenly space the cassettes in the basket to allow for maximal fluid flow around the cassettes for better penetration of reagents and infiltration of wax.

This can easily be achieved using the spring dividers.

For maximal capacity, the cassettes can be stacked together and held in place with the spring, if desired. This is shown on the top left side of the basket.

Place the lid securely on the basket, load the basket into the carrier and position the carrier into the retort.

10.2 – CHECKS AND PROCEDURES BEFORE OPERATING

- ✓ Check paraffin and reagent bottle levels on level surface (between min and max).
- ✓ Check bottle caps for cracks, and secure them.
- ✓ Inspect O-Rings.
- ✓ Check and, if necessary, clean the Retort.
- ✓ Place the samples into the Retort.
- ✓ Close and latch the Retort lid.
- ✓ Select a program.
- ✓ Edit date and time of process-end (a delay function on first step if desired).

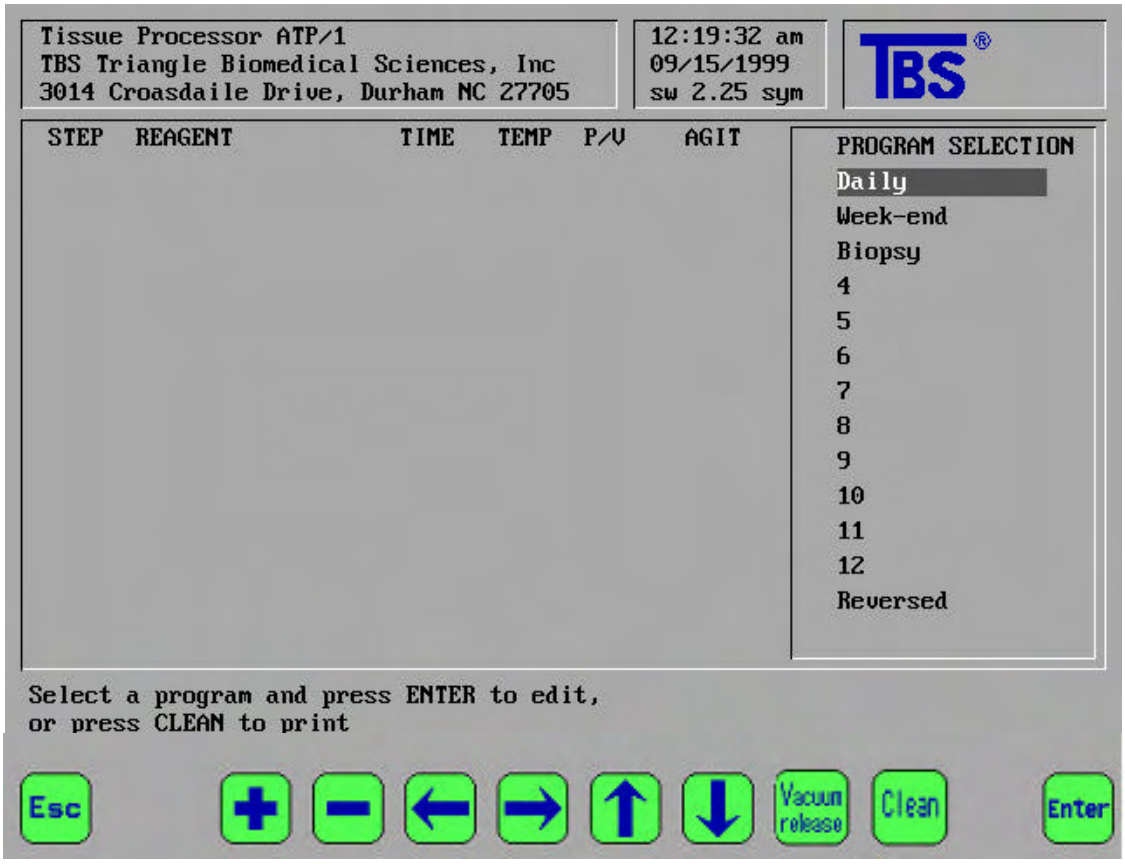
10.3 – SELECTING A PROGRAM

Select **START PROCESS** from the **MAIN** menu.

The screen now should look the same as the **Edit Program** screen.

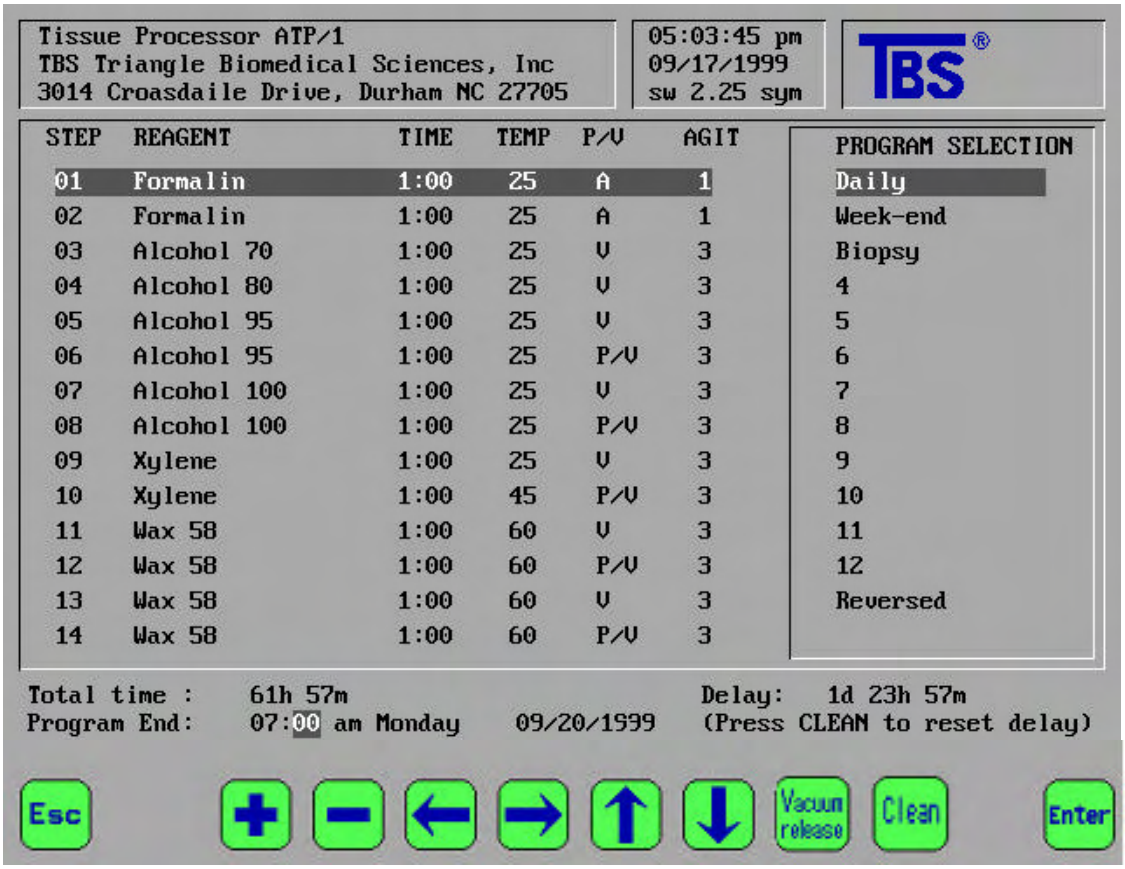
Use the - and ¯ arrows to select the **Program** that is to be utilized.

Press **ENTER** to start the **Program**.



10.4 – SETTING THE PROGRAM COMPLETION TIME/DATE

The **Start Process Screen**:



Two lines are displayed above the icons.

The first line displays the process duration plus the possible presence and duration of any delay in DAYS, HOURS and MINUTES.

The second line will display the time, as determined by the computer, that the process will be completed.

Please note: *The program cannot begin with this screen open; but, the delay will count down while this screen is open. Once the delay reaches zero, the Program End time will begin to increase until you begin the run.*

Setting Delay

Use the ¬ and ® arrows to choose one of the fields which indicate hours, minutes and day of the week of the program completion.

Use the **+** and **-** keys to change the time and date that the program is to end. The computer will automatically update the total processing time, the date of completion and the fields that indicate the amount of the delay expressed in days, hours and minutes. The maximum delay is 7 days.

It is not possible to set an hour or a day of the week less than the starting time added to the duration of the process. As noted above, any time spent in this menu will decrement the delay (if any) or increment the end time if the delay is zero, until you close the menu.

Any delay programmed will extend the length of time specimens remain in the first reagent.

Programming Completion Times

A convenient feature of the ATP™ is that it will automatically remember when a program is to be completed. The computer stores the hour and/or day you have chosen for the process to be completed. The next time you choose the same program, the computer will indicate the same hour and /or day of completion. Any delay necessary to end the process at the predetermined hour and/or day is automatically calculated and displayed in the appropriate display field.

- To reset the delay, press **CLEAN**. The delay will be cancelled and the delay memory will be erased. The next time the program is started, there will be no delay.

- In addition to any special programs, 2 STANDARD programs are recommended:

    - **Daily -** The first time you start the **Daily** program, set only the time of completion (e.g.: 7.30am). After that, any time you select the **Daily** program it will, by default, propose to end automatically the following day at 7.30am.
    - **Weekend -** The first time you start the **Weekend** program, set the completion time and day of the week (e.g.: 7.30am of Monday). The **Weekend** program will end automatically on the following Monday at 7.30, again, unless you press the “CLEAN” button and then set a new delay and end time.

- Completion time **cannot** be set less than current time plus the time to complete process. For example, if you start a 12-hour program at 9:00pm and desire an end time of 7:30am, there is not enough time to complete the process without cutting its time short. The computer will, therefore, automatically adjust the Process End time so that the 12-hour processing schedule is maintained, in this case, by finishing at 9.00am the following morning.

It is highly recommended that the user verify the time, day and date of process completion before starting a program. If it is set incorrectly, the user's only options are to wait for process completion or to remove partially processed tissues from the retort, reprogram and begin a new process. Processing programs cannot be edited once they are begun.

Midweek holidays

There are two convenient solutions for handling midweek holidays:

- Create a third standard program, named for example "HOLIDAYS", where you can set a different completion time to meet the particulars of your schedule.

- Use the Daily setting, but be certain to reset the completion time/date before utilizing the program again.

Starting from step other than the first

Use the - and ¯ arrows. Note that the bar will move from the first step to every valid step (every step is valid if its value is greater than 0). It is possible to select a starting step different from the first step in a particular program.

- This feature could be used, for example, on partially processed tissue samples to restart the processing where it was interrupted.

Runtime Test Aborting Run

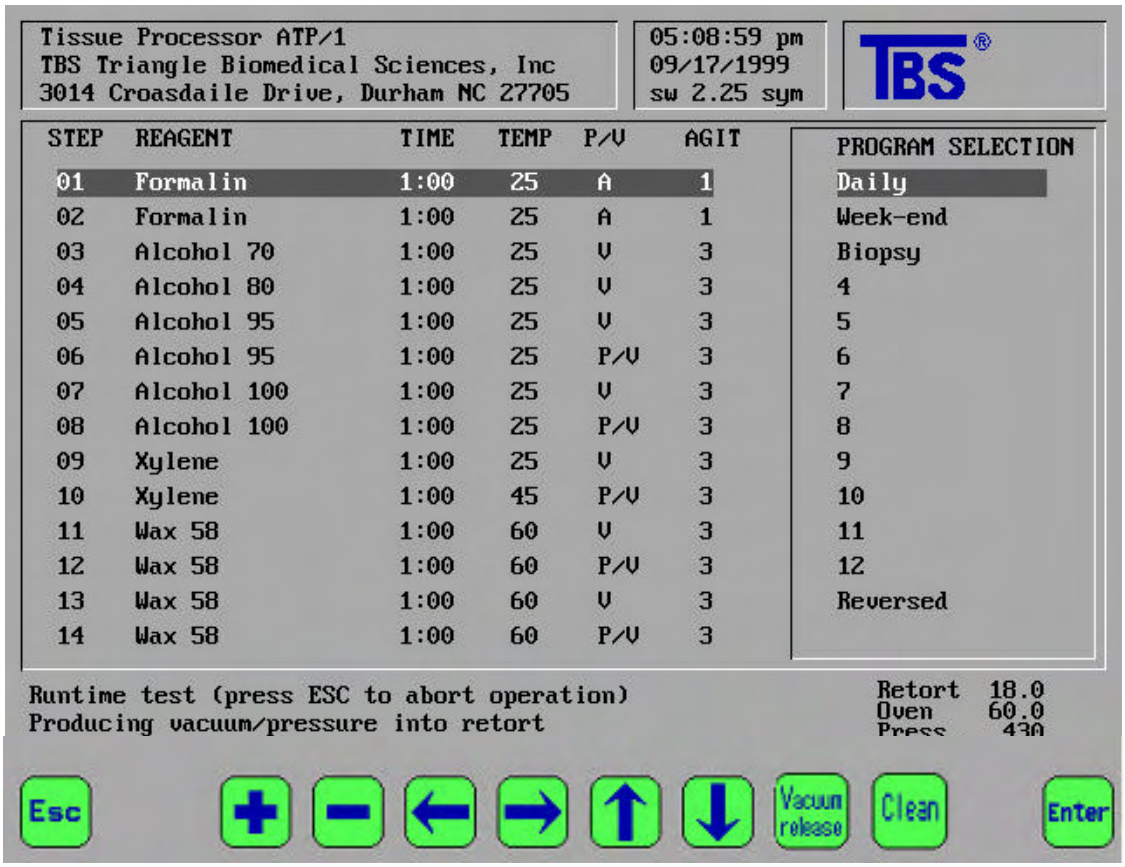
It is possible to practice setting program parameters, and even to launch a program, because during the first phase of RUNTIME **TEST**, you can stop the program simply by pressing the **ESC** key, as the instrument has not yet filled the Retort. Be certain to re-enter the desired values before starting any programs.

10.5 – STARTING A PROCEDURE

After the date and time to complete a program has been entered, the program can be started by pressing **ENTER**.

Use **ESC** to abort the operation and to go back to the main menu without starting the process.

Process execution:



When the program is started, the computer will run a **RUNTIME TEST** on the main functions of the instrument. This test doesn't involve the filling of the Retort and can be stopped at any time by simply pressing the **ESC** key.

If an error condition is detected during the self-testing process, the test will be terminated automatically and a code will appear on the screen.

If the test is successful, the program will start and the program information will appear on the screen.

- The current step is highlighted and the time will count down until the step is complete.

- Any alarms will appear in the window that displayed the program names in the sequence that the alarms occurred.

- The first line in the message area will show the name of the current program and the scheduled date and time of completion.

- The second line will indicate the step that the processor is performing (e.g.: filling or emptying reagent, positioning the rotating valve, etc.).

The window at the bottom right displays:

Retort Retort temperature, in °C
Oven Paraffin chamber temperature, in °C
Press Retort pressure, in millibars

Once a program is started, it requires no intervention.

During the running of a program, it is **NOT** possible to access other functions or edit the program.

10.6 – INTERRUPTING THE PROCESS

A process can only be aborted when the second message line displays "Processing".

The interruption of a program is only possible when the reagent is in stand-by in the Retort and not during the other steps (filling/emptying, positioning the rotating valve, etc.).

To abort a process, press **ESC** and, within 3 seconds, **ENTER**.

The retort will then be emptied and the samples can be removed. If a paraffin step has already been executed, the program calls for the Purge of the retort. It then returns to the main menu, where it is possible to start another program.

The processor does not ask for the Purge Cycle when a program is aborted before using paraffin. It will be necessary to press **CLEAN** to start the Purge Cycle or manually clean the Retort before starting another run.

10.7 – OPENING THE RETORT DURING A PROGRAM

There are some steps in which the retort **CANNOT** be opened and others in which the retort **MUST NOT** be opened.

*While a program is running, **NEVER** open the retort lid in a step other than "Processing". Alarms may occur that would make the computer control system abort the process. Potentially toxic or flammable substances may exit from the retort.*

The retort **can be opened** when the second message line displays "Processing". Please take the following precautions:

- Close the lid as soon as possible.
- Immediately close the lid if the "Processing" message changes.

Respect all the safety rules about the precautions to take when handling toxic or flammable substances.

- If the system is processing during a vacuum step, it will be necessary to press the key **VACUUM RELEASE** before opening the retort. The second message line will then display "Normalizing pressure in the retort," and, after 10 seconds, the retort can be opened. Within one minute the processor will again try to create a vacuum if the step requires this operation. If the Retort is not closed within this time, a non-blocking alarm will occur (VACUUM TIME-OUT) and for the remaining time of the step the processor will **NOT** try again to create a vacuum. Processing quality could be compromised.
- If the opening of the retort is difficult, **DO NOT** force it. Instead, press the **VACUUM RELEASE** key and try again. This may also be necessary when the closed retort is passing from a "hot" to a "cold" state (e.g., immediately after a process) as this creates an internal vacuum that makes it difficult or impossible to open.

10.8 – PROCESS COMPLETION

At the end of a program, the instrument leaves the last reagent in the Retort to prevent the samples from drying out. Press **ENTER** to empty the retort.

After the Retort empties, open the retort and take out the samples (if necessary, press the **VACUUM RELEASE** key).

After removing the samples a message will appear asking the operator to authorize printing of the process report (if the printer is not present, or if a process report is not desired, it will be sufficient to press the **ESC** key to skip this operation).

- If the program included paraffin steps, the **Purge Cycle must be run**.

10.9 – CLEANING THE RETORT (PURGE CYCLE)

Before starting a purge cycle:

- ✓ Empty Retort of all samples
- ✓ Wipe excess wax from the retort and lid
- ✓ Wipe excess wax from the lid gasket
- ✓ Verify reagents levels in Purge bottles P1 & P2

The Purge Cycle is necessary to remove paraffin residue from the Retort. It is always necessary to do so if paraffin was used during the last step.

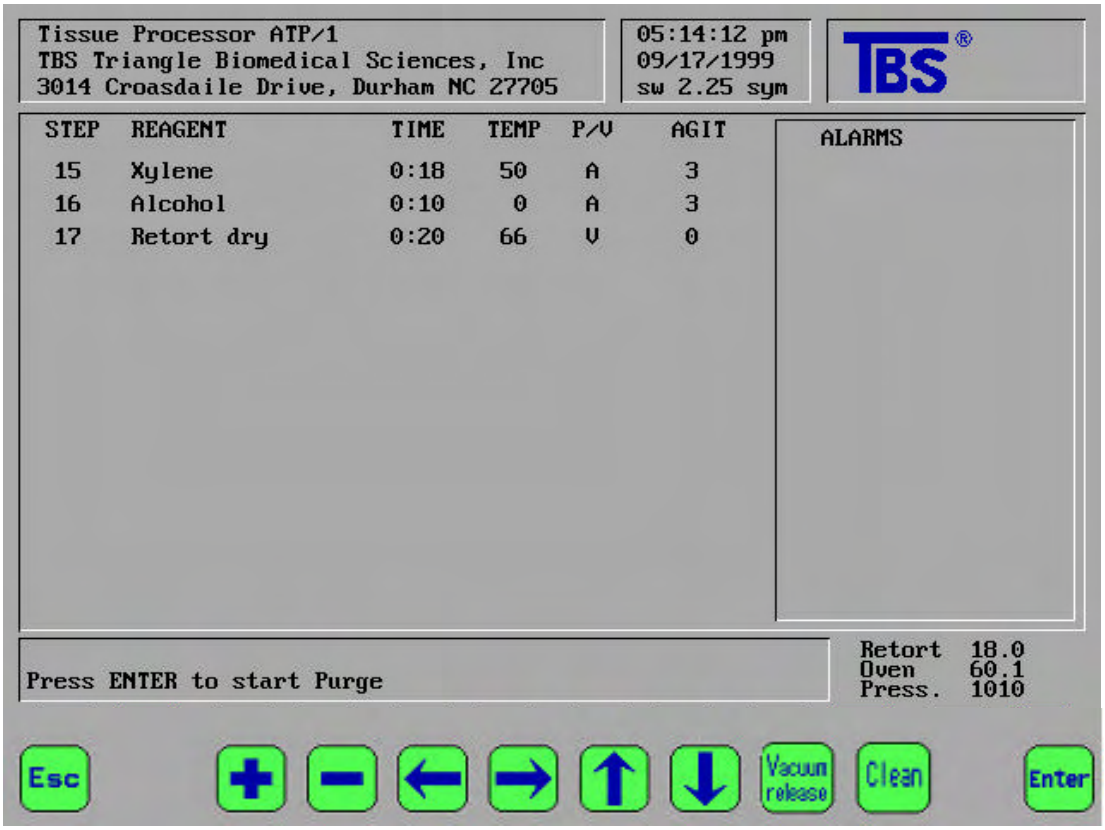
It is preferable to wash the retort even if paraffin has not been used.

The removal of any paraffin residue before the start of the Purge Cycle program is useful to extend the life of the Purge Cycle reagents. Scraping should be done with extreme care. Avoid the use of sharp tools that can damage the Retort surface. A rubber spatula works well. Even if the Retort is maintained at the temperature of the last paraffin until the execution of the Purge Cycle, it is preferable to run the Purge Cycle immediately after the process.

Press **CLEAN** to start the Purge Cycle at any time except when a program is underway. The screen will display data about the Purge Cycle steps.
These steps have been set and optimized by the manufacturer and can **NOT** be changed.

Press **ENTER** to start the Purge Cycle. As in any program, the Purge Cycle can be aborted by pressing **ESC** and then **ENTER** within 3 seconds.

Purge Cycle procedure**:**



The bottles containing the Purge Cycle reagents are labeled with P1 and P2 and must contain: (the first from the left, top row) (P1) xylene (or substitutes), the second (P2) 80% or 100% alcohol.

The Purge Cycle reagent (if not managed by the RMS) must be changed at least every 5 completed paraffin processes.

Take care not to leave fabric or paper residue (normally used in cleaning procedures) as the material can prevent the complete closing of the main valve membrane with subsequent damage or alarms. Pieces of fabric can damage the rotating valve, causing reagent leaks and cross-over contamination between reagents.

The last Purge step is the drying of the Retort of any alcohol residue. This step is not critical and can be stopped at any time without damaging the instrument.

CHAPTER 11 – ALARMS

11.1 – MANAGING ALARMS

There are two types of alarms:

Non-Blocking Alarms

Alarms 1 through 9 are NON-BLOCKING alarms or WARNINGS that **do not interrupt the program.** The event that caused the alarm is not critical for completion of the process, and any program stoppage could produce worse results than continuing.

With NON-BLOCKING alarms, the program will continue and the screen will display the alarm number and a brief explanation of the alarm. In this situation, it is **NOT** desirable to interrupt the process. Upon completion, the cause of the alarm can be determined and addressed by the operator.

Procedures listed below for each type of alarm should be followed to correct the cause of the problem. If following all of the recommended steps to stop the alarm from reoccurring does not help and/or if the problem persists for several processes, the TBS® service department should be contacted.

Blocking Alarms

Alarms 11 through 53 are blocking alarms**.** These are true alarms and **do interrupt process**, as the cause of the alarm makes it impossible to proceed. Continuing the program could cause more serious damage than stopping it.

In the event of a BLOCKING alarm, follow the instructions displayed on the screen:

1) Stop the acoustic alarm.
2) Try to empty the retort.
3) Remove the samples.
4) Reset the instrument.

After the reset, the instrument is again ready to run a program. The alarm could have been simply an error in closing the retort lid or something else easy to resolve. Before proceeding, please check the following:

- ✓ Remove all samples.
- ✓ Check that the retort does not contain any reagent residuals.
- ✓ Check reagent and paraffin bottle levels.
- ✓ Check that the bottles are correctly placed in their housing slots.
- ✓ Check that the paraffin waxes are melted and, if possible, verify their temperature.
- ✓ Check and clean the retort lid gasket.
- ✓ Execute a Purge Cycle to verify the functioning of the instrument.

When uncertain as to the cause of the failure, have a qualified electrician check the line voltage for transient and/or drop-outs at the receptacle. **If the alarm persists, call TBS® technical assistance and do not use the instrument.**

11.2 – NON-BLOCKING ALARMS

1 - BLACK OUT

It indicates that there has been an interruption of power to the instrument. This can occur due to a loss of power in the user's laboratory or merely due to switching the instrument off and then back on. It does not necessarily indicate that there has been a "black out" at your location. If the ATP™ has lost power during a process, its automatic power outage protection will allow it to carry on from where it had been interrupted. How it will do so depends upon what station was active when the power outage occurred, according to the following:

a) Steps 1 to 10 (reagents): No special action, the black-out time is considered processing time and the ATP™ continues as if nothing had happened.

b) Steps 11 - 12 (paraffin): Processing will pause (for approximately as much time as the unit was without power) for the Retort and paraffin containers to return to the proper temperature. The blackout time and the related heating time are NOT considered processing time.

Cause – Loss of power in the lab, a blown instrument fuse, or merely switching the unit off or jarring the power cord out of the wall or out of the instrument.
Solution – If the power supply doesn't return, check the electric network, plug and cable. If necessary, replace the instrument fuses as described in Chapter 14. The alarm will be displayed on the screen until the cause is removed. If the instrument is found working (after a black-out), but, this alarm appears too frequently (e.g. more than once in a month), it would be prudent to have the unit connected to its own power supply (separate circuit and breaker). As a separate issue, uninterruptible power supplies (UPSes) may be utilized to protect against power fluctuations and spikes; but, even larger UPSes will provide only a few minutes of electricity for instruments like the ATP™ that consume a large amount of current. **CAUTION:** All laboratory tissue processors rely on the fact that power outages at hospitals, clinics and industrial facilities will be of a short duration (less than one entire process step), as they should have adequate backup generators, etc. No tissue processor can protect samples totally from long delays, especially in dehydrant steps. If you anticipate an extended power outage, take steps to protect your tissue samples or the processing quality could be compromised.

2 - RETORT T° LOW

At the end of a step, (after the drain but before the start of the next step) the retort temperature is not at the value required by the program. This check is done only at the end of a stand-by step because it is not possible to know how much time is necessary for the reagent to reach the correct temperature. The time is strictly related to other parameters, such as: required temperature, ambient temperature, type and quantity of reagent, quantity of samples in the retort, etc.

This is a non-blocking alarm because reagent heating is not critical for obtaining good results. If the alarm involves the Retort heating system, the instrument will possibly be blocked during the first paraffin step. The process is not ended but the samples will be left in paraffin with little or no damage as compared to being in other reagents for a long period of time.

This alarm may frequently appear during very short steps, in this case is not a problem because it is normal that the retort temperature will not reach the set point temperature during very short steps.

> **Cause –** Incorrect working or damage of: temperature sensor, heating resistance, safety thermostat.
> **Solution –** No intervention by the user is possible. If the problem persists, contact TBS® for technical assistance.

3 - SHORT DRAIN

The duration of the drain was too short.

> **Cause –** Insufficient level of reagent in the indicated bottle.
> **Solution –** Verify reagent levels on level surface, not mounted in unit. If this occurs during the alcohol step of the Purge Cycle, reduce the percentage of alcohol from 100% to 80%, but maintain the volume at the normal level.

4 - P/V TIMEOUT

Occurs if the instrument is unable to create processing pressure or vacuum in the Retort at the scheduled time. The processor will not try to create pressure or vacuum in that step and will go on with the program. During the next step, if scheduled, it will try again.

> **Cause –** Pump failure, lid gasket leakage.
> **Solution –** Check and clean the lid gasket.

5 - FULL FILL P
6 - FULL FILL S

Excessive level of reagent in the Retort during the fill; the overfill is recognized (by the sensor “S” or by the pressure gradient “P”) and the filling is stopped before it can produce a failure. The process can continue without problems.

Cause – Excessive level of reagent in the bottle.
Solution – Verify reagent levels.

7 - FILE NOT FOUND

A file has not been found or an incomplete file has been found in the computer memory; the recovery systems will replace the lost or incomplete file from a backup copy.

Cause – The buffer battery of the CPU memory is exhausted.
Solution – No intervention by the user is possible. If the problem persists, contact TBS® technical service.

8 - LONG DRAIN

The time required to drain the retort was excessive.

Cause – Insufficient pressure in the retort due to: inefficient air pump, an air leak in the pneumatic circuit or an air leak from the retort lid gasket.
Solution – Check the retort lid gasket; contact the TBS® service department for other causes.

9 - T° WAX LOW

During the process but before the first paraffin (step 11), the temperature of the paraffin chamber has dropped too low; the process will continue until the last reagent. If during the draining of the last reagent the problem persists, the process will be stopped. (See also Alarm 20.)

Cause – The thermo-regulation system of the paraffin chamber is out of order.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance

11.3 – BLOCKING ALARMS

11 - FILL NO VACUUM

The instrument was unable to produce a vacuum in the Retort while attempting to fill from a reagent or paraffin station.

Cause – During the filling stage, a serious leak in the pneumatic or hydraulic circuit occurred; a failed pump; an almost empty reagent bottle; or incomplete closure of the retort lid.
Solution – Check the bottle reagent level and quick connector o-rings as well as the Retort lid gasket. If the problem persists, contact the TBS® service department for technical assistance.

12 - FILL TIME OUT

The filling from a reagent or paraffin bottle has not occurred in the allotted time.

Cause – See Alarm 11.
Solution – See Alarm 11.

13 - OVER FILL S

An overfill of reagent or paraffin has occurred in the Retort (detected by the overfill sensor).

Cause – Incomplete emptying of previous reagent due to a solenoid valve failure or a paraffin temperature problem.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance.

14 - OVER T° RETORT

During a paraffin step the Retort temperature went over the allowed limit (not to be confused with alarm #20).

Cause – Thermostat system damage.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance.

15 - TSC OUT

Malfunction of the retort temperature sensor.

Cause – TSC sensor failure.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance.

16 - SHORT FILL

A fill is completed before the minimum allotted time. The retort will drain and the process will proceed to the next step. If the problem persists, the process will be stopped.

Cause – The reagent bottle quick connector is not fully inserted into the female receptacle; inefficient air pump.
Solution – Check reagent bottle position and fluid levels. If it happens on the alcohol stage of the Purge Cycle, reduce the percentage of the alcohol to 80%. If the problem persists, contact the TBS® service department for technical assistance

17 - VR OUT

The rotary valve is out of position.

Cause – The Rotary Valve motor has failed or the Rotary Valve position sensor has failed.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance

18 - FILE NOT FOUND

An essential computer file is damaged or cannot be found and the error recovery system failed trying to correct the problem.

Cause – Computer malfunction, back-up battery failure.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance

19 - RETORT T° LOW

The retort temperature was too low during the drain following a paraffin step, or the drain cannot be completed. The process will be stopped to avoid other problems. (See also Alarm 2.)

Cause – Retort heating system failure.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance

20 - WAX T° LOW

During the fill of a paraffin, the temperature of the retort was too low. The process will be halted because the fill cannot be guaranteed.

Cause – See Alarm 14.
Solution – See Alarm 14.

21 - OVER T° WAX

The temperature of the paraffin chamber has exceeded the set point.

Cause – Temperature system failure.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance

22 - TSW OUT

The electrical signal from the CCW temperature sensor is out of the correct range.

Cause – The sensor has malfunctioned.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance

23 - PRESSURE N.R.

During the first phase of a drain, the pressure in the retort has not reached the correct value. The process will be stopped.

Cause – The air pump or other pneumatic circuit parts have malfunctioned.
Solution – No intervention by the user is possible. If the problem persists, contact the TBS® service department for technical assistance.

24 - DRAIN NO PRESS

During the second phase of a drain, the pressure in the retort has not reached the correct value. The process will be stopped.

Cause – See Alarm 23.
Solution – See Alarm 23.

25 - DRAIN TIME OUT

The drain has gone over the maximum time allowed. The process will be stopped.

Cause – See Alarm 23.
Solution – See Alarm 23.

26 - RET. NOT EMPTY

The user has attempted to begin a process with the retort either not empty or without having run a Purge Cycle following the previous process.

Cause – Due to another alarm or due to an interrupted process, the retort is not empty. Also caused by neglecting to purge after a process.
Solution – Clean the retort, if it is not empty, drain it manually. At the Service Menu perform the "**Alarm Reset**" and the "**Flag Reset**". Return to the Main Menu and start the Purge Cycle using the "CLEAN" key.

27 - OVER FILL P

An overfill of reagent or paraffin has occurred in the Retort. (Alarm sensed by fast pressure gradient during fill.)

Cause – Complete emptying of the previous reagent failed.
Solution – No intervention by the user is possible. If the problem persists, contact our technical assistance

30 - COM ERROR [FRAME]

A communication error between the CPU and serial board.

Cause – A component or connection in the computer has failed**.**
Solution – Contact the TBS® service department for assistance.

31 - COM ERROR [PARITY]

See Alarm 30.

Cause – See Alarm 30.
Solution – See Alarm 30.

32 - COM ERROR [OVERRUN]

See Alarm 30.

Cause – See Alarm 30.
Solution – See Alarm 30.

33 - COM ERROR [TIMEOUT]

See Alarm 30.

Cause – See Alarm 30.
Solution – See Alarm 30.

39 - COM ERROR [LINE OR PORT DOWN]

See Alarm 30.

Cause – See Alarm 30.
Solution – See Alarm 30.

40 - ELODEV LACK

A failure of the touch screen. The display will still be functional.

Cause – A failure has occurred in the Touch Screen membrane circuit, power supply, connectors, CPU board, or Disk-on-Chip.
Solution – A standard computer keyboard may be connected to the 5 pin din connector keyboard connector next to the remote alarm connector on the upper rear of the ATP™. All the functions of the ATP™ can be operated from the keyboard if the display screen is working, but not the touch screen membrane. Contact the TBS® service department for assistance.

50 - OVER PRESSURE

The purpose of this alarm is to exclude the clogging of a pneumatic line, which greatly reduces the volume of the overall plumbing system, from the causes of alarms # 2, 4, 5, 8, 11, 12, 23, 24, 25, 27.

Cause – A blockage in a pneumatic system of the ATP™ prior to the Retort. The problem may be a bad connection or a faulty signal from the pressure transducer. The pressure transducer may have failed.
Solution – Check: the pneumatic plumbing system between the pump and the Retort for blockages. Contact the TBS® service department for assistance.

51 - OVER VACUUM

See Alarm 50.

Cause – See Alarm 50.
Solution – See Alarm 50.

52 – PS BREAK – HIGH

Pressure Transducer problem.

Cause – See Alarm 50.
Solution – See Alarm 50.

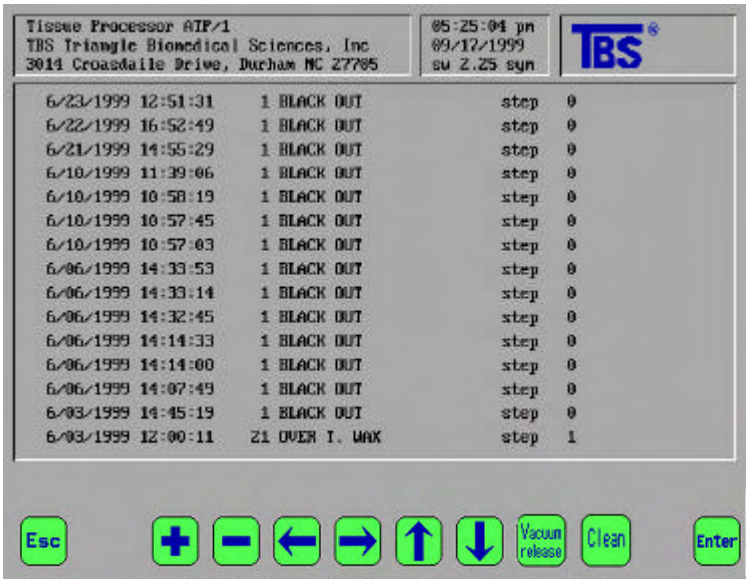
53 – PS BREAK – LOW

Pressure Transducer problem.

Cause – See Alarm 50.
Solution – See Alarm 50.

11.4 – ALARMS HISTORICAL ARCHIVE

The alarms historical archive is under the **SETUP** menu and consists of a list of the last 100 alarm occurrences. This feature assists a service technician to identify the problem, its frequency, the step in which it occurred and other useful information to help solve the problem.


Tissue Processor AIP/1
TBS Triangle Biomedical Sciences, Inc
3014 Croasdaile Drive, Durham NC 27705
05:25:04 pm
09/17/1999
sw 2.25 syn
TBS
6/23/1999 12:51:31 1 BLACK OUT step 0
6/22/1999 16:52:49 1 BLACK OUT step 0
6/21/1999 14:55:29 1 BLACK OUT step 0
6/10/1999 11:39:06 1 BLACK OUT step 0
6/10/1999 10:58:19 1 BLACK OUT step 0
6/10/1999 10:57:45 1 BLACK OUT step 0
6/10/1999 10:57:03 1 BLACK OUT step 0
6/06/1999 14:33:53 1 BLACK OUT step 0
6/06/1999 14:33:14 1 BLACK OUT step 0
6/06/1999 14:32:45 1 BLACK OUT step 0
6/06/1999 14:14:33 1 BLACK OUT step 0
6/06/1999 14:14:00 1 BLACK OUT step 0
6/06/1999 14:07:49 1 BLACK OUT step 0
6/03/1999 14:45:19 1 BLACK OUT step 0
6/03/1999 12:00:11 21 OVER I. WAX step 1
Esc
Vacuum release
Clean
Enter

Alarms are displayed from top to bottom on the screen, starting with the most recent problem. Use ¯ arrow to display older alarms. When it reaches the end of the alarm list, the system goes back to **MAIN** menu. Use **ESC** to go back to **MAIN** menu.

11.5 – INSTRUMENT RESET

In the event the software has locked up and the instrument ceases operation, the software can be reset by the following procedure:
On the rear of the instrument there is a green reset button. Its function is to reset the software under the following conditions:

- If, for any reason, the user is unable to reset an alarm from the keyboard
- If a user faces some other unexpected situation that cannot be resolved by any other means
- To reset that part of the instrument's memory that holds variables pertaining to the state and content of the retort, possible steps in process, possible actions in process and/or alarms in process

The procedure for using the reset button is as follows:

- Switch off the instrument (the switch is located where the power cord enters the tissue processor).
- **Press and hold** the green button in the down position.
- Switch on the instrument, **maintaining the green button in the down position** until such time as the Main Menu appears on the LCD screen again.

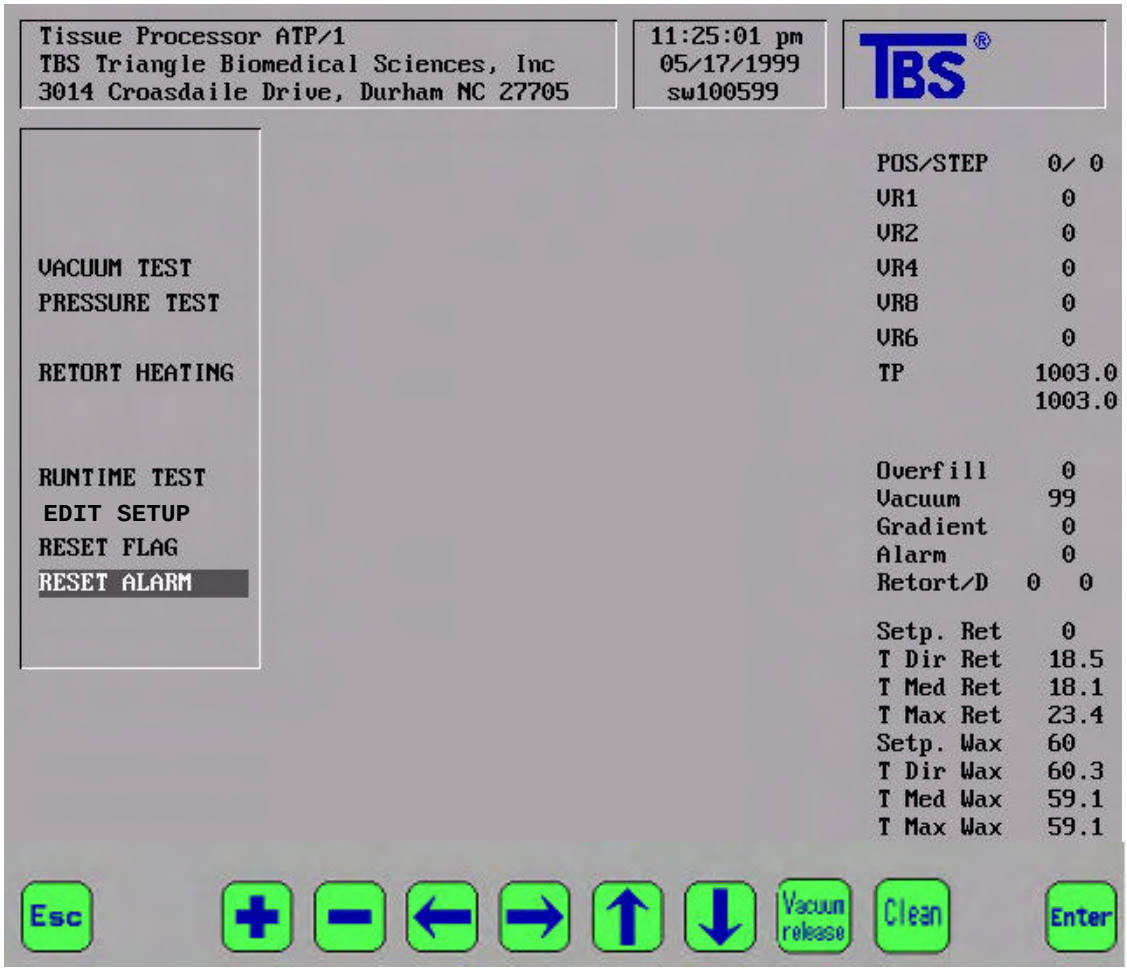
After this operation, the ATP™ will be ready for operation again, but first the user **MUST** verify the following:

- ✓ That the retort is empty.
- ✓ That the retort is clean (above all in reference to the paraffin).
- ✓ That the lid gasket of the retort is clean and in its correct position.
- ✓ That the instrument works correctly, by performing tests from the service menu.
- ✓ That an alarm present before the reset is not again displayed (in this case will be necessary to switch off the instrument and call the TBS® service department, with the exception of an alarm #1).
- ✓ It is advisable to run a Purge Cycle and/or an abbreviated process before attempting a sample run in order to verify the correct operation of the processor.
- ✓ Be certain to perform the checklist (located in Chapter 10.8) before starting a program **or** a Purge Cycle.

CHAPTER 12 – SERVICE MENU

12.1 – END USER SERVICE TESTS

The **End-user Service Menu:**



Vacuum test

The instrument will create a vacuum as if a program is running; this test should be done with the retort empty.

- The instrument should reach a pressure between 300 and 350mBar (TP field) within 50 to 60 seconds (GRADIENT field).

If the GRADIENT value exceeds 60 seconds, the Retort lid gasket should be checked and cleaned. If this does not correct the problem, contact the TBS® service department for technical service.

Pressure Test

The instrument will create the pressure in the Retort as if a program is running; this test should be done with the retort empty.

- The instrument should create a pressure between 1200 and 1250mBar (TP field) in a maximum time of 60 seconds (GRADIENT field).

If this does not happen, check and clean the Retort lid gasket; if the problem still persists, contact our technical service.

Retort Heating

This test is to:

- Check the heating elements for the Retort.
- Melt the paraffin residuals that could be remaining in the Retort in case of an alarm or a breakdown.

The Retort temperature is automatically brought to 60°C.
This process may require up to 30 minutes. This test can be stopped at any time.

Runtime Test

The tests are the same as for the start of a program. This function is important to check after a long period of inactivity.

Edit Setup

This is where you can set the following items:

- Language
- Reseller
- Format for Display Date
- Serial Baud – 1200 is default
- Elevation –Important for high altitude laboratories
- L/L Alarms – Enable/Disable Low Level Alarms Beeping, Error codes will still be displayed even if sound is disabled.
- EOP Beeping – Enable/Disable End of Process Beeping
- POS Sensor – only adjustable by service technician

Reset Flag

This function has the same effect as the Reset Button located on the rear panel of the instrument.

Alarms Reset

This function is used to eliminate an alarm in order to run tests of the instrument. It is also utilized after a problem has been corrected, (i.e. in order to continue on with beginning processes, etc.) It is also useful to reset the alarms occurring during other tests on the instrument.

If there has been a power loss or the unit has been powered off and on, the alarm reset will need to be used to clear the Blackout Alarm.

12.2 – SERVICE MENU ABBREVIATION LIST

On the Right side of the screen are a number of values identified by abbreviations defined below:

POS	Rotary Valve position
STEP	Rotary Valve position required
VR1-6	Binary Rotary Valve position
TP	Retort direct and average pressure
OVERFILL	Overfill sensor status
VACUUM	Retort pressure management
GRADIENT	Time necessary to make vacuum and pressure in the Retort
ALARM	Running alarm code
RETORT	Number of the current contents of the retort
/D	Number of the last reagent in the Retort (0 If Purge Cycle Run)
SETP RET	Retort temperature set point
T DIR RET	Retort direct temperature
T MED RET	Retort average temperature (on 20 direct reads)
T MAX RET	Retort maximum temperature raised after the last reset
SETP WAX	Paraffin Chamber temperature set point
T DIR WAX	Paraffin Chamber direct temperature
T MED WAX	Paraffin Chamber average temperature (on 20 direct reads)
T MAX WAX	Paraffin Chamber maximum temperature raised after the last reset

12.3 – SERVICE ASSISTANCE

Before calling TBS® Product Service, please collect the following information:

- ✓ Type of instrument
- ✓ Serial number
- ✓ Software release
- ✓ The number of any alarm that has occurred
- ✓ A print of the Alarm Archive (if the printer is available)

Please provide this information to Product Service upon contact. Our telephone number is **919-384-9393.** The department is staffed **8:00 AM to 6:00 PM EST or DST**.

CHAPTER 13 – SAFETY FEATURES

13.1 – PROTECTION AGAINST OVERHEATING

The thermostat controls include a maximum temperature cutoff switch to prevent overheating of the paraffin chamber and Retort.

These devices do not prevent alarms, but, prevent overheating when primary control devices fail. DO NOT use the instrument when an alarm indicating a strange temperature increase is illuminated.

In the event of overheating, it is best to switch off the instrument and disconnect it completely.

13.2 – PROTECTION AGAINST EXCESS PRESSURE

There is no danger of excess pressure mishaps. The pressure levels developed in the retort are small and do not present any major hazard.

A light pressure can be present in the retort at the end of a process. The lid must be opened with care to avoid the possibility of eye injury by reagent vapors and splashing. Always wear safety glasses when handling reagents or working to identify problems.

CHAPTER 14 – INSTRUMENT MAINTENANCE

14.1 – DAILY MAINTENANCE

The daily maintenance of the instrument consists of:

- ✓ Cleaning the Retort
- ✓ Cleaning the Retort lid and gasket
- ✓ Checking and possible replacement of reagent and paraffin
- ✓ Checking and possible replacement of bottle caps
- ✓ Checking that reagent and paraffin bottles are correctly seated and filled to the proper level

14.2 – MONTHLY MAINTENANCE

The following monthly maintenance is recommended:

- ✓ Replace the charcoal filters as indicated in Chapter 6.3 and any time there are excessive reagent fumes.
- ✓ When replacing reagents, carefully clean the bottles
- ✓ Grease the Retort lid gasket with silicone grease (Cat # 7PV999)
- ✓ Grease the bottle insertion o-rings with silicone grease (Cat # 7PV999)
- ✓ Check for reagent residues at the bottom of paraffin bottles.

Remember that both bottles and paraffin are at a temperature of ~60°C; therefore contact with them can cause burns.

14.3 – PARAFFIN WAX PURIFICATION CYCLE

An important addition to the ATP™ maintenance process is the Paraffin Wax Purification Cycle, or **WPC**. Regular use of this feature will significantly reduce paraffin consumption and thus time spent replacing or "maintaining" reagents. The **WPC** works by using air and heat to vaporize contaminant reagent carryover in the paraffin waxes and then trapping these vapors in the charcoal filters. Using this process, the majority of xylenes carried over into the initial paraffin steps are removed.

*This purification process takes place in the paraffin bottles; the retort **is not filled with paraffin**, so, unlike other tissue processes, it is not necessary to run a Purge Cycle after the execution of the **WPC**.*

Another advantage of conducting this process in the bottles is that it can be stopped at any time to begin a new process without draining the retort and having to run a Purge Cycle, thus saving 30 to 50 minutes.

- To maximize the value of this process and to therefore minimize paraffin consumption, the **WPC** should be run after every process.

Important note: *The retort should be cleaned (using the Purge Cycle following a process) prior to starting the **WPC** and the retort lid MUST remain closed during the purification cycle.*

Although there will be no paraffin in the retort, it is important to keep the retort closed during the process to ensure proper functioning of the pneumatic (air) circuit. If you must open the retort for some reason or if you wish to start a process before the **WPC** is complete, use the **ESC** key to halt the **WPC** before opening the lid.

14.4 – CHARCOAL FILTERS REPLACEMENT

Filter replacement is required approximately every 60 to 120 processes, based upon environmental factors and use of the **WPC**. We estimate that:

- **Without** the use of the **WPC**, filter life will be from 90 - 120 processes
- **With** the use of the **WPC**, filter life will be from 60 - 90 processes

These values are only estimates because they are influenced by:

- Environmental factors (humidity, temperature)
- The duration of the processes
- The application of the vacuum (or pressure) on all the steps of the process
- The frequency of reagent agitation

Regardless of usage, the charcoal filters should be changed at least once every six months. To order additional filters, specify Cat # 8A1850.

Exhausted filters must be replaced with the required frequency as they may release toxic and contaminated vapors into the air if left too long.

Exhausted filter waste is to be handled in accordance with local, state and national regulations.

14.5 – RETORT LID GASKET REPLACEMENT

The Retort lid gasket is made of VITON™ rubber (a DuPont trademark). It needs to be periodically greased with TEFLON grease (Cat # 7PV999). When replacing, use a sharp point – not a metallic one – to extract the gasket. Carefully clean the gasket housing slot and replace the gasket with a new one.

14.6 – FUSE REPLACEMENT

Fuse replacement should be done only by qualified personnel.

Please note: *Always disconnect the instrument! Never use fuses of a different rating and never try to repair damaged fuses.*

The ATP™ contains four (4) line voltage fuses. Fuses are in fuse holders located on the rear panel. See the illustration in Chapter 3.3 for details.

There are 4 glass fuses of a 10 Amp (6 x 25 mm) rating in holders at the rear or the unit.

To replace fuses:

1. Disconnect the cable from the socket on the power entry module.
2. Open the small door under the socket with your fingers or a screwdriver and extract the holder containing the fuses with the help of a pair of tweezers.
3. Replace the fuses.
4. Replace the Fuse holder in the instrument.
5. Reconnect the power cable.

CHAPTER 15 – ACCESSORIES

15.1 – PRINTER

The ATP™ is equipped with a serial port in the back panel for the connection of a printer. TBS® offers a printer specifically for the ATP™ (cat # ATP1-P), or, any kind of serial printer with the following characteristics can be used:

- ✓ At least 40 columns
- ✓ Speed of the serial port adjustable to 600 Baud
- ✓ Speed of printing 15 cps or greater
- ✓ Serial cable with 9 poles Canon connector
- ✓ Electric autonomous feeding

Features of the ATP™ specific printer (Star DP 8340):

- ✓ 40 columns
- ✓ Printing on normal paper
- ✓ Roll of inside paper, of 25m., of easy substitution
- ✓ Cartridge to inky ribbon of easy substitution
- ✓ Extreme compactness (could be positioned on the cover of the ATP™)
- ✓ Speed of printing of 20 cps
- ✓ Electric autonomous feeding
- ✓ CE certification and UL
- ✓ Serial cable
- ✓ Specific manual of use and maintenance

For the use of the printer, please consult its specific manual.
The pin usage of the ATP™ serial port is the following:

ATP™ SERIAL PORT	DESCRIPTION	PRINTER CONNECTOR
1 - DCD	Unused	
2 - RD		TX
3 - SD		RX
4 - DTR	Unused	
5 - GND		GND
6 - DSR		DTR
7 - RTS	Unused	
8 - CTS		RTS
9 - RI	Unused	

Please note: *The manufacturer declines any responsibility for the correct operation of printers other than specified in the present manual.*

15.2 – REMOTE ALARM AND AUTO-DIALER

An automated dialer can be attached which will automatically dial a pre-set number if an alarm occurs during a run.

The socket of the Remote Alarm connector has 3 contacts with the following disposition:

No alarm	= contacts 1-2 closed, contacts 1-3 open.
Alarm in course	= contacts 1-2 open, contacts 1-3 closed.

Because there are no voltages of any kind present on these contacts (they are isolated from the rest of the instrument), they can be utilized to activate an external device such as an Auto-Dialer to call a pre-selected number and relay the message that an alarm has occurred.

If you wish to attach such a device to the ATP™ but do not wish to purchase our Auto-Dialer, or, if you have a proprietary system already in place, please note the following constraints on the connector and its associated electronics:

Maximum allowed voltage: 48V AC/DC
Maximum allowed current: 6A

For instructions related to the Auto-Dialer, please consult the manual included with the dialer.

APPENDIX 1 – ACCESSORIES AND SPARE PARTS

DESCRIPTION	U/M	CAT#
Accessories		
Auto Dialer	Ea	ATP1-AD
Printer (with: main power cord, serial cable, 1 paper roll, 1 ink ribbon, user manual)	Ea	ATP1-P
Charcoal filters 2/CS	CS	ATP-CFB
Paraffin/reagent bottles (reusable, quick connector) 6/CS	CS	ATP1-BR
Paraffin/reagent bottles (reusable, bottles only – no caps or connectors)	Ea	ATP1-123
Screw caps for reagent bottles, solid 10/CS	CS	ATP1-BC
Screw caps with cut-out for Quick Coupler Fitting	Ea	ATP1-177
Basket, regular, cassette capacity – 150 (with: 1 cover, 4 dividers, and 4 springs)	Ea	ATP1-B150
Basket, bulk, cassette capacity – 200-220 random or 350 stacked (with: 1 cover)	Ea	ATP1-BB
Carrier Handle for easy movement of baskets (fits 2 ATP1-B150, or 1 ATP1-BB)	Ea	ATP1-259
Paper roll for printer 12/Cs	Cs	ATP1-PP
Ink ribbon for printer 6/Cs	Cs	ATP1-PR
ATP™ user manual (English)	Ea	ATP1-OM
Main power cord	Ea	43177R
User Replaceable Spare Parts		
Fuses, 10A, 250V	Pair	F483-ND
Retort lid gasket	Ea	ATP1-205
Quick Coupler O-Rings Small (2 per coupler)	Ea	9464K65
Quick coupler O-Rings Large (1 per coupler)	Ea	9464K34
ATP™ service manual (English)	Ea	ATP1-SM

For the complete list of spare parts, see the Technical and/or Service Manual.

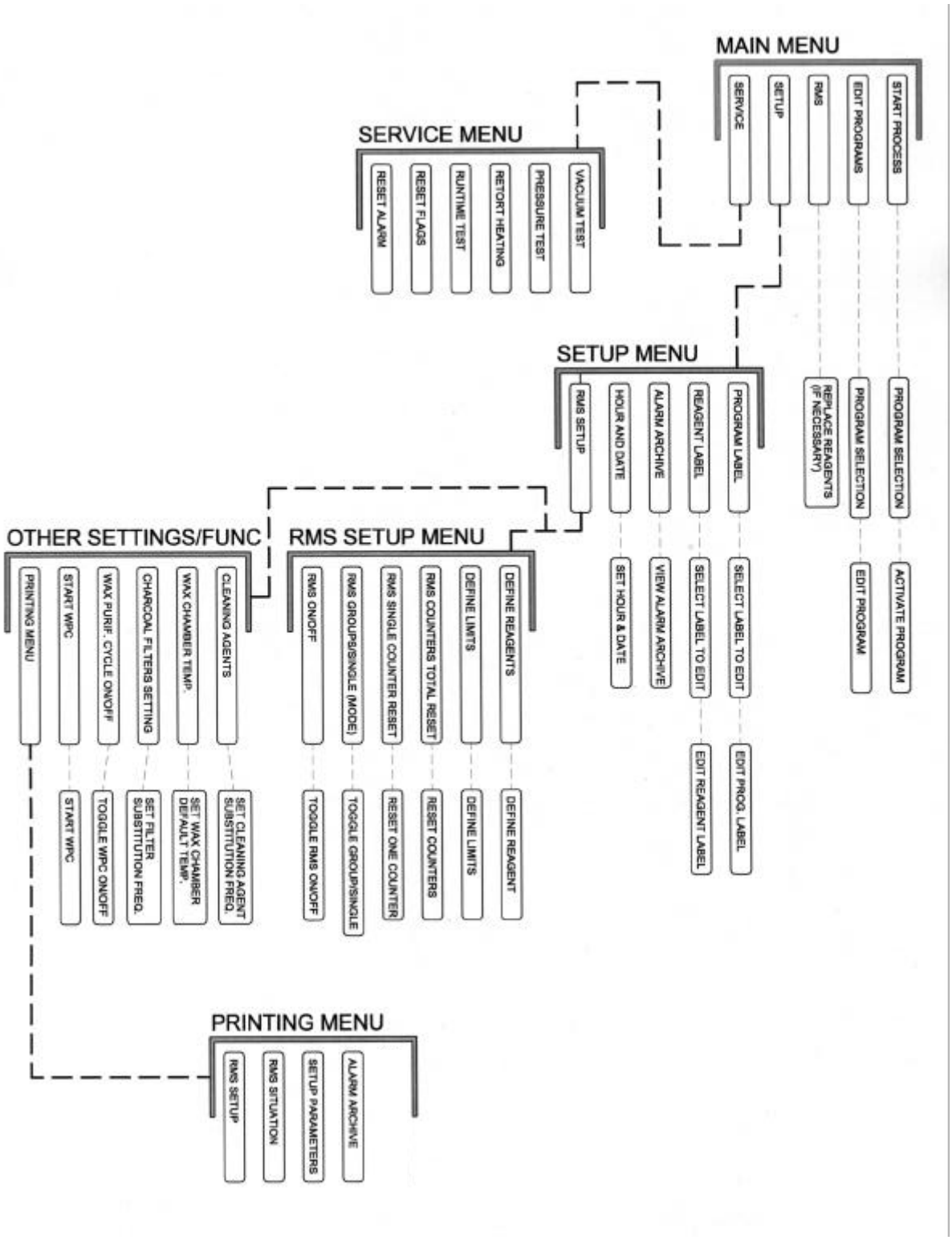
APPENDIX 2 – ATP™ TECHNICAL DATA SHEET

Rating	220V, 50Hz; 110V, 60Hz
Max power	1400 W
Fuse	2x10A (5x20mm)+ 2x10A (6x25mm)
Weight	120 Kg (264 lbs.)
Dimension in mm (floor standing version)	H 1338 - W 524 - D 600
Dimension in mm (table top version)	H 770 - W 1048 - D 600
Height	130 cm (33 in)
Width	53 cm (13.5 in)
Depth	60 cm (15 in)
Running ambient temperature	10° / 30° C
Storing temperature	0° / 40° C
Sample processing capacity	300
Paraffin temperature (warm chamber)	50° / 60° C
Paraffin temperature (during the process)	50° / 60° C
Reagent temperature (during the process)	Ambient / 45° C
Temperature accuracy	+/- 1° C
Reagent filling time	45 s
Reagent draining time	30 s
Pressure range	300/1350 mBar (ambient = 1000 mBar)
Filling pressure	750 mBar
Draining pressure	1250 mBar

APPENDIX 3 – ATP™ FEATURES

Electronics	Based on an industrial CPU with an Intel microprocessor
Software language	Microsoft C 6.00
Display	9.5” LCD - VGA mono tilting touch screen (panel-off feature to increase the life of the display and the display light)
Shell (user interface)	User friendly (Windows like) shell; simple and clear menu guides the user over the running of the instrument; all the events are guided by 2 alert rows; temperatures and pressures are always displayed on the monitor
Number of programs	12 + Reversed (14 steps each)
Program features	Max step time: 12 hours. Up to 7 days delay; start of a process from any step; process can be aborted at any step.
Anti-blackout device	The CPU memory is battery backed-up. In the event of a blackout, the processor restarts the process from the interrupted point. In the event a BO stops the process during a paraffin step, a delay function allows sufficient time for paraffin melting before restarting the program.
Reagents selection	All reagents and paraffin are selected by a rotating valve
Number of reagents	10 (contained in a 2.5 lt. bottle)
Number of paraffin	4 (contained in a 2.5 lt. Bottle)
Pre-heated paraffin	1 slot
Number of Purge reagents	2 (contained in a 2.5 lt. Bottle)
Number of filters	2 charcoal (contained in a 2.5 lt. – modified bottle)
Retort	Stainless steel
Purge duration	From 28 to 48 minutes
Purge steps	3 (xylene, alcohol 95%, drying)
Sample capacity	Up to 300 samples (250 organized)
Sample basket	2x stainless steel - 150 samples each (125 samples each with spring organizers) 1x stainless steel - 200 samples random

APPENDIX 4 – ATP™ PROGRAM MENU FLOW



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